STIC Search Report
EIC 1700

STIC Database Tracking Number: 118055

TO: Andrew L Oltmans
Location:
Art Unit : 1742
April 2, 2004

Case Serial Number: 10/014310

From: Barba Koroma
Location: EIC 1700
REM EO4 A30
Phone: 571 272 2546

barba.koroma@uspto.gov

Search Notes

Examiner Oltmans,
Please find attached results of the search you requested. Various components of the claimed invention as spelt out in the claims were searched in multiple databases.

For your convenience, titles of hits have been listed to help you peruse the results set quickly. This is followed by a detailed printout of records. Please let me know if you have any questions.
Thanks.

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=> file caplus
COST IN U.S. DOLLARS                              SINCE FILE      TOTAL
                                                       ENTRY    SESSION
FULL ESTIMATED COST                                     4.01     354.22

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)        SINCE FILE      TOTAL
                                                       ENTRY    SESSION
CA SUBSCRIBER PRICE                                     0.00      -7.62

FILE 'CAPLUS' ENTERED AT 18:02:24 ON 02 APR 2004
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FILE COVERS 1907 - 2 Apr 2004  VOL 140 ISS 15
FILE LAST UPDATED: 1 Apr 2004  (20040401/ED)

  This file contains CAS Registry Numbers for easy and accurate
  substance identification.


=> file jicst
COST IN U.S. DOLLARS                              SINCE FILE      TOTAL
                                                       ENTRY    SESSION
FULL ESTIMATED COST                                     0.44     354.66

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)        SINCE FILE      TOTAL
                                                       ENTRY    SESSION
CA SUBSCRIBER PRICE                                     0.00      -7.62

FILE 'JICST-EPLUS' ENTERED AT 18:02:30 ON 02 APR 2004
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FILE COVERS 1985 TO 22 MAR 2004 (20040322/ED)

THE JICST-EPLUS FILE HAS BEEN RELOADED TO REFLECT THE 1999 CONTROLLED
TERM (/CT) THESAURUS RELOAD.

=> file wpix
COST IN U.S. DOLLARS                              SINCE FILE      TOTAL
                                                       ENTRY    SESSION
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FULL ESTIMATED COST                                   0.51     355.17

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)      SINCE FILE      TOTAL
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CA SUBSCRIBER PRICE                                   0.00      -7.62

FILE 'WPIX' ENTERED AT 18:02:33 ON 02 APR 2004
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FILE LAST UPDATED:          31 MAR 2004      <20040331/UP>
MOST RECENT DERWENT UPDATE:     200422       <200422/DW>
DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE


>>> FOR A COPY OF THE DERWENT WORLD PATENTS INDEX STN USER GUIDE,
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 http://www.stn-international.de/training_center/patents/stn_guide.pdf <<<

>>> FOR DETAILS OF THE PATENTS COVERED IN CURRENT UPDATES, SEE
    http://thomsonderwent.com/coverage/latestupdates/           <<<

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    http://thomsonderwent.com/support/userguides/               <<<

>>> ADDITIONAL POLYMER INDEXING CODES WILL BE IMPLEMENTED FROM
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    SDIS USING THE TIME RANGE CODE WILL NEED TO BE UPDATED.
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    FIRST VIEW - FILE WPIFV. FREE CONNECT HOUR UNTIL 1 MAY 2004.
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=> file japio
COST IN U.S. DOLLARS                            SINCE FILE      TOTAL
                                                     ENTRY    SESSION
FULL ESTIMATED COST                                   1.92     357.09

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)      SINCE FILE      TOTAL
                                                     ENTRY    SESSION
CA SUBSCRIBER PRICE                                   0.00      -7.62

FILE 'JAPIO' ENTERED AT 18:02:38 ON 02 APR 2004
COPYRIGHT (C) 2004 Japanese Patent Office (JPO)- JAPIO

FILE LAST UPDATED: 1 MAR 2004       <20040301/UP>
FILE COVERS APR 1973 TO OCTOBER 31, 2003
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<<< GRAPHIC IMAGES AVAILABLE >>>

=> file compendex

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	1.27	358.36

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE ENTRY	TOTAL SESSION
CA SUBSCRIBER PRICE	0.00	-7.62

FILE 'COMPENDEX' ENTERED AT 18:02:58 ON 02 APR 2004

FILE LAST UPDATED: 29 MAR 2004 <20040329/UP>
FILE COVERS 1970 TO DATE.

<<< SIMULTANEOUS LEFT AND RIGHT TRUNCATION AVAILABLE IN
THE BASIC INDEX >>>

=> d que

L2	1	SEA FILE=REGISTRY ABB=ON PLU=ON TANTALUM/CN
L3	124304	SEA FILE=CAPLUS ABB=ON PLU=ON L2 OR TANTALUM OR TA
L4	1256	SEA FILE=CAPLUS ABB=ON PLU=ON L3 AND TEXTURE?
L5	31051	SEA FILE=CAPLUS ABB=ON PLU=ON L3(L)(ARRANG? OR CHARACTER OR COARSE? OR CONSISTENCY OR FEEL? OR FINENESS OR GRAIN OR MAKEUP OR ORGANIZATION OR PATTERN OR ROUGHNESS OR SMOOTHNESS OR STRUCTURE OR MICROSTRUCTURE OR SURFACE)
L6	31692	SEA FILE=CAPLUS ABB=ON PLU=ON L4 OR L5
L7	50	SEA FILE=CAPLUS ABB=ON PLU=ON L6 AND POLE(4A)FIGURE
L9	1	SEA FILE=CAPLUS ABB=ON PLU=ON L6 AND CENTER(4A)PEAK
L10	70	SEA FILE=CAPLUS ABB=ON PLU=ON L6 AND PEAK(4A)INTENSITY
L11	119	SEA FILE=CAPLUS ABB=ON PLU=ON L7 OR L9 OR L10
L12	25	SEA FILE=CAPLUS ABB=ON PLU=ON L11 AND "100"
L13	350	SEA FILE=CAPLUS ABB=ON PLU=ON L3 AND SURFACE(4A)MORPHOL?
L14	31789	SEA FILE=CAPLUS ABB=ON PLU=ON L6 OR L13
L15	118	SEA FILE=CAPLUS ABB=ON PLU=ON L14 AND (POLE(4A)FIGURE OR PEAK(4A)INTENSITY)
L17	497	SEA FILE=CAPLUS ABB=ON PLU=ON L14 AND CRYSTAL?(4A)ORIENT?
L18	3	SEA FILE=CAPLUS ABB=ON PLU=ON L14 AND MILLER(4A)(INDEX OR INDICES?)
L19	122	SEA FILE=CAPLUS ABB=ON PLU=ON L14 AND GRAIN(4A)ORIENTATION
L24	16	SEA FILE=CAPLUS ABB=ON PLU=ON L14 AND ORIENTATION(4A)IMAG?
L25	110	SEA FILE=CAPLUS ABB=ON PLU=ON L14 AND DISTRIBUT?(4A)FUNCTION
L28	1	SEA FILE=CAPLUS ABB=ON PLU=ON L14 AND KIKU?(4A)PATTERN?
L29	3	SEA FILE=CAPLUS ABB=ON PLU=ON L14 AND KIKU?
L32	57	SEA FILE=CAPLUS ABB=ON PLU=ON (100 OR 111)(5A)(MILLER(4A)(IND ICES OR INDEX))
L33	1146	SEA FILE=CAPLUS ABB=ON PLU=ON L11 OR L12 OR L13 OR L15 OR

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                L17 OR L18 OR L19 OR L24 OR L25 OR L28 OR L29 OR L32
L38         179 SEA FILE=CAPLUS ABB=ON  PLU=ON  L33 AND (MILLER? OR POLE(4A)FIG
                URE OR PEAK(4A)INTENS?)
L39          99 SEA FILE=CAPLUS ABB=ON  PLU=ON  L38 AND (100 OR 111 OR 17)
L40          42 SEA FILE=CAPLUS ABB=ON  PLU=ON  L39 AND (TA OR TANTALUM)
L41           9 SEA FILE=WPIX ABB=ON  PLU=ON  L39 AND (TA OR TANTALUM)
L42           6 SEA FILE=WPIX ABB=ON  PLU=ON  (TA OR TANTALUM) AND (PEAK(4A)INT
                ENSITY OR POLE(4A)FIGURE) AND (100 OR 111) AND (TEXTURE? OR
                GRAIN? OR STRUCTURE? OR MORPHOLOGY)
L43           4 SEA FILE=WPIX ABB=ON  PLU=ON  (L41 OR L42) AND CRYSTAL?
L44           5 SEA FILE=COMPENDEX ABB=ON  PLU=ON  (L41 OR L42) AND CRYSTAL?
L45           4 SEA FILE=JICST-EPLUS ABB=ON  PLU=ON  (L41 OR L42) AND CRYSTAL?

L82         256 SEA FILE=CAPLUS ABB=ON  PLU=ON  L4 AND SPUTTER?
L83         256 SEA FILE=CAPLUS ABB=ON  PLU=ON  L82 AND TEXTURE?
L86           5 SEA FILE=CAPLUS ABB=ON  PLU=ON  L83 AND STRIP?
L87          47 SEA FILE=CAPLUS ABB=ON  PLU=ON  L86 OR L40
L88          55 DUP REM L87 L43 L44 L45 (5 DUPLICATES REMOVED)
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=> d ti 1-55
YOU HAVE REQUESTED DATA FROM FILE 'WPIX, COMPENDEX, JICST-EPLUS, CAPLUS' -
CONTINUE? (Y)/N:y

L88 ANSWER 1 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 1
TI **Tantalum** carbide-coated carbon composites having good durability

L88 ANSWER 2 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Texture**, **structure** and phase transformation in sputter
beta **tantalum** coating

L88 ANSWER 3 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Sintered **tantalum** targets having **textured**-grain
structure for uniform **sputtering**

L88 ANSWER 4 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Low-friction carbon-rich carbide coatings deposited by co-
sputtering

L88 ANSWER 5 OF 55 COMPENDEX COPYRIGHT 2004 EEI on STN
TI Characterization and Property of Ti-**Ta**-O Films Fabricated by
Plasma Immersion Ion Implantation and Deposition.

L88 ANSWER 6 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Sputtering target for giving sputter-deposited film with uniform thickness

L88 ANSWER 7 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Relationship between preferred orientation and stress in multilayered
Au/NiCr/**Ta** films

L88 ANSWER 8 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Improvement of TaNx barrier effectiveness without Cu **(111)** **texture** degradation

L88 ANSWER 9 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Structure and morphology of epitaxially intergrown **(100)**- and (116)-oriented SrBi2Ta2O9 ferroelectric thin films on SrLaGaO4(110) substrates

L88 ANSWER 10 OF 55 JICST-EPlus COPYRIGHT 2004 JST on STN
TI Characterization of TiO2 Films Prepared by Pulsed Laser Deposition.

L88 ANSWER 11 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Effect of diffusion barrier on **surface morphology** and structure of Cu-Zr alloy films

L88 ANSWER 12 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 2
TI Residual stress and microstructure of electroplated Cu film on different barrier layers

L88 ANSWER 13 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Hot-rolled **Ta strip** for fabrication of fine-grained targets for cathodic **sputtering** in electronic applications

L88 ANSWER 14 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Synthesis and properties of highly oriented (Sr,Ba)(Nb,**Ta**)2O6 thin films by chemical solution deposition

L88 ANSWER 15 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Interfacial reaction pathways and kinetics during annealing of **111** **-textured** Al/TiN bilayers: A synchrotron x-ray diffraction and transmission electron microscopy study

L88 ANSWER 16 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI High resolution **texture** analysis of thin blanket films and discreet test structures in semiconductor devices

L88 ANSWER 17 OF 55 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Raw alloy of nano-composite magnets and its powder, nano-composite magnet powder, and the method manufacturing them.

L88 ANSWER 18 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Texture** development of blanket electroplated copper films

L88 ANSWER 19 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI On the strengthening of Ni3Al by hafnium additions

L88 ANSWER 20 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Variation of orientation and morphology of epitaxial SrBi2Ta2O9 and SrBi2Nb2O9 thin films via the coating-pyrolysis process

L88 ANSWER 21 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN

TI Image plate X-ray diffraction and X-ray reflectivity characterization of protective coatings and thin films

L88 ANSWER 22 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI High-purity **tantalum strip** manufactured with uniform microstructure and **texture** for **sputtering** targets

L88 ANSWER 23 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Texture** analysis of damascene-fabricated Cu lines by x-ray diffraction and electron backscatter diffraction and its impact on electromigration performance

L88 ANSWER 24 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Processing of oriented K(**Ta**,Nb)O3 films using chemical solution deposition

L88 ANSWER 25 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Cold drawing and annealing **textures** of **tantalum** wires

L88 ANSWER 26 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 3
TI Effect of ultra-thin Cu underlayer on the magnetic properties of Ni80Fe20/Fe50Mn50 films

L88 ANSWER 27 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Pyrochlore-type phases for actinides and rare earth elements immobilization

L88 ANSWER 28 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Microstructure and crystallographic **texture** of reactively sputtered FeTaN films

L88 ANSWER 29 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Textures** of thin copper films

L88 ANSWER 30 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Microstructure and **texture** of electroplated copper in damascene structures

L88 ANSWER 31 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Raman characterization of amorphous and nanocrystalline sp3 bonded structures

L88 ANSWER 32 OF 55 JICST-EPlus COPYRIGHT 2004 JST on STN
TI Effect of Pt Electrode Orientation on SrBi2Ta2O9 Thin Films Prepared by Sol-Gel Method.

L88 ANSWER 33 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Microstructures and properties of high saturation soft magnetic materials for advanced recording heads

L88 ANSWER 34 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Synthesis of highly oriented K(**Ta**,Nb)O3 (**Ta**:Nb =

65:35) film using metal alkoxides

L88 ANSWER 35 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 4
TI Growth of oxide crystals thin films through sol-gel method. KTN epitaxy film

L88 ANSWER 36 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Effect of RTA on leakage current of Ta2O5 thin films deposited by PECVD

L88 ANSWER 37 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Texture** and **microstructure** of rolled and annealed **tantalum**

L88 ANSWER 38 OF 55 COMPENDEX COPYRIGHT 2004 EEI on STN
TI Magnetic properties of two-phase nanocrystalline alloy determined by anisotropy and exchange interactions through amorphous matrix.

L88 ANSWER 39 OF 55 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Sliding members having increased surface hardness - are obtd. by electroplating metal of controlled **crystal structure.**

L88 ANSWER 40 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Pole figure** and orientation **distribution function** analyses of face centered cubic and body centered cubic metals

L88 ANSWER 41 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Helium-atom scattering study of the temperature-dependent charge-density-wave **surface structure** and lattice dynamics of 2H-**tantalum** diselenide (001)

L88 ANSWER 42 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Characterization of rhodium films on **tantalum**(110)

L88 ANSWER 43 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI The location of **tantalum** atoms in nickel-aluminum-**tantalum** alloys [Ni3(Al,**Ta**)]

L88 ANSWER 44 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 5
TI Effect of **crystallographic orientation** on mechanical properties of **tantalum** single crystals grown by electron-beam melting

L88 ANSWER 45 OF 55 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Semiconductor device with composite electrode structure - having low resistance and improved breakdown voltage.

L88 ANSWER 46 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Graphoepitaxial growth of zinc sulfide on a **textured** natural crystalline surface relief foreign substrate

L88 ANSWER 47 OF 55 COMPENDEX COPYRIGHT 2004 EEI on STN
TI MAGNETIC AND STRUCTURAL CHARACTERISTICS OF ION BEAM SPUTTER DEPOSITED

Co-Cr THIN FILMS.

L88 ANSWER 48 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Effect of oxygen on the **surface** ionization of potassium on the (112) face of **tantalum**

L88 ANSWER 49 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Mechanical properties of **tantalum** single crystals grown by electron beam melting methods

L88 ANSWER 50 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Substructure and preferred orientation of rolling of pure metals with a body centered cubic lattice

L88 ANSWER 51 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Attachment to the mass spectrometer MV2302 for chemical research

L88 ANSWER 52 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI X-ray spectrographic determination of **tantalum** in niobium by electron excitation

L88 ANSWER 53 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Spectral normal emittance of single crystals

L88 ANSWER 54 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Physical metallurgy of uncommon metals

L88 ANSWER 55 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
TI Oriented dioxide films on uranium

=> d all 1-55 188
YOU HAVE REQUESTED DATA FROM FILE 'WPIX, COMPENDEX, JICST-EPLUS, CAPLUS' - CONTINUE? (Y)/N:y

L88 ANSWER 1 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 1
AN 2004:80624 CAPLUS
DN 140:115764
ED Entered STN: 01 Feb 2004
TI **Tantalum** carbide-coated carbon composites having good durability
IN Takagi, Takashi; Noro, Tadashi
PA Ibiden Co., Ltd., Japan
SO PCT Int. Appl., 41 pp.
CODEN: PIXXD2
DT Patent
LA Japanese
IC ICM C04B041-87
ICS C04B035-36; C23C016-32; H01L021-205
CC 57-8 (Ceramics)
Section cross-reference(s): 75

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FAN.CNT 1
     PATENT NO.        KIND  DATE          APPLICATION NO.   DATE
     ---------------   ----  --------      ---------------   --------
PI   WO 2004009515     A1    20040129      WO 2003-JP8189    20030627
         W:  CN, KR, US
         RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE,
             IT, LU, MC, NL, PT, RO, SE, SI, SK, TR
     JP 2004084057     A2    20040318      JP 2003-39675     20030218
PRAI JP 2002-191387    A     20020628
     JP 2002-191388    A     20020628
     JP 2003-39675     A     20030218
```

AB The C composites have a C substrate and a **Ta** carbide layer, where the X-ray diffraction **pattern** of the crystal constituting the **Ta** carbide layer, the ratio of the **intensity** of the **peak** corresponding to the (200) face to that of the peak corresponding to the (**111**) face: I(200)/I(**111**) is 0.2 to 0.5, or the ratio of the **intensity** of the **peak** corresponding to the (**111**) face to that of the peak corresponding to the (200) face: I(**111**)/I(200) is 0.2 to 0.5. The composites are excellent in durability and are free from the occurrence of damages such as cracking and exfoliation resulting from exhaustion or the like even after being used at a high temperature in an atmospheric of a reducing gas or a reactive gas for a long period of time. The composites are suitable for CVD device for coating of Si or SiC single crystal wafers, etc.

ST **tantalum** carbide coated carbon composite durability CVD device

IT Coating materials
Composites
Vapor deposition apparatus
(**tantalum** carbide-coated carbon composites having good durability for CVD devices)

IT 409-21-2P, Silicon carbide, preparation 7440-21-3P, Silicon, preparation
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(single crystal wafer, CVD device for coating of; **tantalum** carbide-coated carbon composites having good durability for CVD devices)

IT 7440-44-0, Carbon, properties 12070-06-3, **Tantalum** carbide
RL: DEV (Device component use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(**tantalum** carbide-coated carbon composites having good durability for CVD devices)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE
(1) Nippon Steel Corp; JP 05-238856 A 1993 CAPLUS
(2) Ohwada Carbon Industrial Co Ltd; JP 05-97554 A 1994 CAPLUS
(3) Ohwada Carbon Industrial Co Ltd; US 5368940 A 1994 CAPLUS
(4) Toyo Tanso Co Ltd; JP 10-236892 A 1998 CAPLUS
(5) Toyo Tanso Co Ltd; JP 10-245285 A 1998 CAPLUS

L88 ANSWER 2 OF 55 CAPLUS

AN 2004:107998 CAPLUS
ED Entered STN: 10 Feb 2004
TI **Texture**, **structure** and phase transformation in sputter beta **tantalum** coating
AU Lee, S. L.; Doxbeck, M.; Mueller, J.; Cipollo, M.; Cote, P.
CS Development and Engineering Center, Benet Labs, US Army Armament Research, Watervliet, NY, 12189-4050, USA
SO Surface and Coatings Technology (2004), 177-178, 44-51
CODEN: SCTEEJ; ISSN: 0257-8972
PB Elsevier Science B.V.
DT Journal
LA English
CC 55 (Ferrous Metals and Alloys)
AB Structural properties of **tantalum** are of interest because of its potential application in high temperature wear and erosion. In this paper, we report on beta **tantalum** coatings, which were sputter-deposited onto inner **surface** of steel cylinders, and flat steel and glass plates. Two forms of beta **tantalum** coatings were generally observed: high (002) fiber-**texture** at low sputter gas pressure, and more random oriented beta **tantalum** at higher sputter gas pressure. Two-dimensional XRD and **pole figure** analyses showed both belong to the same tetragonal **structure.** **Structure** simulation was made using a tetragonal cell, a=1.0194 nm, c=0.5313 nm, space group P42/mnm and a very similar cell, a=1.0211 nm, c=0.53064 nm, space group P-421m by Frank-Kasper (1958, 1959) and Arakcheeva (2002). Diffraction **pattern** generated using the former space group allows (001) reflections for even 1, while the latter allows both even and odd (001) reflections. The latter model provides better interpretation of our data. Upon annealing, the (002) **grains** in random oriented **tantalum** became unstable at 300 °C, and complete beta to alpha **tantalum** phase transformation occurred at .apprx.750 °C, resulting in alpha **tantalum** with (110) preferred orientation. In highly **textured** (002) beta **tantalum**, hot hardness measurements showed hardness decreased drastically between 250 and 350 °C to hardness values of alpha **tantalum**, suggesting a phase transformation approx. 300 °C. XRD data showed partial beta to alpha phase transformation and re-**orientation** of the (002)-**grains** at **100** °C, and was more intense at 300 °C.
RE.CNT 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Anon; ICDD (International Centre for Diffraction Data) Database 2002
(2) Arakcheeva, A; Acta Cryst B 2002, V58, P1
(3) Cabral, C; J Vac Sci Technol B 1994, V12(4), P2818 CAPLUS
(4) Catania, P; J Appl Phys 1993, V74(2), P1008 CAPLUS
(5) Clevenger, L; J Appl Phys 1992, V72(10), P4918 CAPLUS
(6) Cox, J; Proceedings of Tri-Service Gun Tube Wear and Erosion Symposium 1982, P277
(7) Donohue, J; Acta Cryst B 1971, V27, P1740 CAPLUS
(8) Frank, F; Acta Cryst 1958, V11, P184 CAPLUS
(9) Frank, F; Acta Cryst 1959, V12, P483 CAPLUS

(10) Holloway, K; Appl Phys Lett 1990, V57(17), P1736 CAPLUS
(11) Hoogeveen, R; Thin Solid Films 1996, V275, P230
(12) Klaver, P; Thin Solid Films 2002, V413, P110 CAPLUS
(13) Latt, K; Mater Sci Eng B 2002, V94, P111
(14) Lawson, A; Acta Cryst B 1988, V44, P89
(15) Lee, S; Surf Coat Technol 1999, V120-121, P44 CAPLUS
(16) Lee, S; Surf Coat Technol 2002, V149, P62 CAPLUS
(17) Lee, S; Thin Solid Films 2002, V420-421, P287 CAPLUS
(18) Liu, L; Mater Sci Eng C 2001, V16, P85
(19) Matson, D; Surf Coat Technol 2000, V133-134, P411 CAPLUS
(20) Matson, D; Surf Coat Technol 2001, V146-147, P344 CAPLUS
(21) Moseley, P; Acta Cryst B 1973, V29, P1170 CAPLUS
(22) Nolze, G; POWDERCELL software 2003
(23) Read, M; Appl Phys Lett 1965, V7(3), P51 CAPLUS
(24) Whitacre, J; Mat Res Soc Symp Proc 1999, V562, P141 CAPLUS
(25) Whitacre, J; PhD dissertation, University of Michigan 2000
(26) Windover, D; PhD Dissertation, Rensselaer Polytechnic Institute 2002

L88 ANSWER 3 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:242537 CAPLUS
DN 138:241532
ED Entered STN: 28 Mar 2003
TI Sintered **tantalum** targets having **textured**-grain structure for uniform **sputtering**
IN Koenigsmann, Holger J.; Gilman, Paul S.
PA Praxair S. T. Technology, Inc., USA
SO PCT Int. Appl., 17 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM C22C027-02
CC 56-4 (Nonferrous Metals and Alloys)
Section cross-reference(s): 76
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2003025238	A1	20030327	WO 2002-US26480	20020821

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	US 2003089429	A1	20030515	US 2001-955348	20010918
PRAI	US 2001-955348	A	20010918		

AB The **Ta-sputtering** target includes a sintered **Ta** core formed from powder, and a **sputtering** surface for coating a substrate (especially semiconductor chip). The sintered **Ta**

grains have the crystallog. orientation with ≥40% of the (222) direction, and <15% of the (110) direction in the **Ta**-atom transport away from the **sputter** face, for increased **sputtering** uniformity. The sintered **Ta** target is preferably mounted on Cu backing plate for stable support. The **Ta** targets are preferably manufactured by powder consolidation and sintering to near-theor. d., followed by **strip** rolling, annealing, brazing to the backing plate, and finish machining.

ST **tantalum sputtering** uniformity sintered target **texture**

IT **Sputtering**
(**Ta**, target for; sintered **tantalum** target with **textured** grain structure for uniform **sputtering**)

IT Semiconductor materials
(**sputtering** on; sintered **tantalum** target with **textured** grain structure for uniform **sputtering**)

IT 7440-50-8, Copper, uses
RL: DEV (Device component use); USES (Uses)
(backing plate, **sputtering** target on; sintered **tantalum** target with **textured** grain structure for uniform **sputtering**)

IT **7440-25-7**, **Tantalum**, processes
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(**sputtering** of; sintered **tantalum** target with **textured** grain structure for uniform **sputtering**)

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE
(1) Cabot Corporation; WO 0031310 A1 2000 CAPLUS
(2) Dunlop; US 5590389 A 1996
(3) Turner; US 6331233 B1 2001 CAPLUS
(4) Zhang; US 6193821 B1 2001 CAPLUS

L88 ANSWER 4 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:600825 CAPLUS
DN 140:30362
ED Entered STN: 06 Aug 2003
TI Low-friction carbon-rich carbide coatings deposited by co-**sputtering**
AU Nilsson, Daniel; Svahn, Fredrik; Wiklund, Urban; Hogmark, Sture
CS Department of Materials Science, Uppsala University, Uppsala, SE-751 21, Swed.
SO Wear (2003), 254(11), 1084-1091
CODEN: WEARAH; ISSN: 0043-1648
PB Elsevier Science B.V.
DT Journal
LA English
CC 57-8 (Ceramics)
Section cross-reference(s): 56
AB Low-friction coatings are used more and more frequently, particularly in situations and applications with insufficient or no lubrication. A good example of such coatings is amorphous carbon, which is produced both in

pure form (a-C:H) and doped with metal (Me-C:H). The knowledge of what actually occurs when one metal in a Me-C:H coating is exchanged with another has so far been rather limited. Also, when producing these films hydrogen is incorporated in the substrate as well as in the film, which can be detrimental to the overall properties. Here, a newly adopted co-**sputtering** technique, utilizing a carbon target partly covered by metal-foil **strips**, was used to deposit non-hydrogenated carbon coatings alloyed with **Ta**, W and Zr on ball-bearing steel (BBS) substrates. The metal content varied between 0 and 41 atomic%, and the resulting films were analyzed with respect to phase composition and **textures**, chemical composition, microstructural morphol., as well as mech. and tribol. properties. All alloyed coatings displayed a nanocomposite microstructure, with 3-6 nm metal-carbide crystallites embedded in a matrix of amorphous carbon. The amount of metal-carbide phase increased with increasing amts. of metal which led to a large increase in hardness and elastic modulus. An increased metal content did however not affect the carbide size to any notable extent. Ball-on-disk tests show that metal addns. cause a sharp drop in friction coefficient from 0.21 to about 0.05, depending on the metal used. This is however accompanied by an increase in wear rate. The coating best combining low friction and low wear rate was alloyed with 20 atomic % **Ta.** Best possible protection of the counter surface was offered by coatings containing 30 atomic% **Ta** or more.

ST antifriction coating carbon metal carbide **sputtering** deposition property

IT Coating materials
(antifriction; deposition and characterization of low-friction carbon-rich metal carbide coatings deposited by co-**sputtering**)

IT Elasticity
Friction
Hardness (mechanical)
Microstructure
Sputtering
(deposition and characterization of low-friction carbon-rich metal carbide coatings deposited by co-**sputtering**)

IT 12597-69-2, Steel, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(ball-bearing; deposition and characterization of low-friction carbon-rich metal carbide coatings deposited by co-**sputtering**)

IT **7440-25-7**, **Tantalum**, uses 7440-33-7, Tungsten, uses
7440-67-7, Zirconium, uses
RL: MOA (Modifier or additive use); USES (Uses)
(carbon coatings containing; deposition and characterization of low-friction carbon-rich metal carbide coatings deposited by co-**sputtering**)

IT 12070-06-3, **Tantalum** carbide 12070-12-1, Tungsten carbide
12070-14-3, Zirconium carbide
RL: MOA (Modifier or additive use); USES (Uses)
(carbon-rich coatings; deposition and characterization of low-friction carbon-rich metal carbide coatings deposited by co-**sputtering**

)
IT 7440-44-0, Carbon, properties
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(metal-containing coatings; deposition and characterization of low-friction carbon-rich metal carbide coatings deposited by co-**sputtering**
)
RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Anon; Powder Diffraction File no 20-1316 (JCPDS-ICDD for cubic WC1-x)
(2) Anon; Powder Diffraction File no 74-1221 (JCPDS-ICDD for cubic ZrC)
(3) Anon; Powder Diffraction File no 74-1223 (JCPDS-ICDD for cubic TaC)
(4) Cullity, B; Elements of X-Ray Diffraction 1967
(5) Dimigen, H; Surf Coatings Technol 1991, V49, P543 CAPLUS
(6) Ettmayer, P; Encyclopedia of Inorganic Chemistry 1994, P519
(7) Feng, B; Surf Coatings Technol 2001, V148, P153 CAPLUS
(8) Gahlin, R; Proceedings of the 9th Nordic Symposium on Tribology 2000, P65 CAPLUS
(9) Liu, Y; J Mater Sci 1997, V32, P3491 CAPLUS
(10) Liu, Y; Surf Coatings Technol 1996, V82, P48 CAPLUS
(11) Matthews, A; Diamond Related Mater 1994, V3, P902 CAPLUS
(12) Minevich, A; Surf Coatings Technol 1992, V53, P161 CAPLUS
(13) Nilsson, D; Proceedings of the 6th International Tribology Conference-AUSTRIB'02 VI, P95
(14) Oliver, W; J Mater Res 1992, V7(6), P1564 CAPLUS
(15) Raveh, A; Surf Coatings Technol 1993, V58, P45 CAPLUS
(16) Voevodin, A; J Appl Phys 1997, V82, P855 CAPLUS
(17) Voevodin, A; Thin Solid Films 1999, V342, P194 CAPLUS
(18) Yang, S; Surf Coatings Technol 2000, V131, P412 CAPLUS
(19) Yang, S; Surf Coatings Technol 2001, V142/144, P85

L88 ANSWER 5 OF 55 COMPENDEX
AN 2003(43):4606 COMPENDEX
TI Characterization and Property of Ti-**Ta**-O Films Fabricated by Plasma Immersion Ion Implantation and Deposition.
AU Chen, J.Y. (Sch. of Mat. Science and Engineering Southwest Jiaotong University, Chengdu 610031, China); Leng, Y.X.; Wan, G.J.; Yang, P.; Sun, H.; Wang, J.; Huang, N.
MT 2003 IEEE International Conference on Plasma Science.
MO Plasma Science and Applications Committee of IEEE
ML Jeju, South Korea
MD 02 Jun 2003-05 Jun 2003
SO IEEE International Conference on Plasma Science 2003.p 398
CODEN: 85PSAO ISSN: 0730-9244
PY 2003
MN 61599
DT Conference Article
TC Experimental
LA English
AB Many new film materials are potentially useful as blood contacting materials, including TIN, SiC, diamond-like carbon, and TiO2, etc, but they have not yet been commercial developed up to now. We have fabricated

titanium oxide films doped with Ta5+ using magnetron sputtering technology and found that the films have excellent properties such as a high level of blood compatibility. However, the deposition method is difficult to apply for the **surface** modification of actual devices. In this paper, we describe work in which we have synthesized Ti-**Ta**-O hybrid films using plasma immersion ion implantation and deposition (PIII-D) and investigated the characterization and property of the films. PIII-D technology is readily applied to components with complex shape. A Ti-**Ta** alloy cathode, 14 mm in diameter, was used in the metal vacuum arc plasma source. Ti-**Ta** plasma was generated in the metal arc source and streamed into the chamber. Background oxygen pressure was sustained by a flow monitor system. The Ti-**Ta**-O hybrid films were deposited on Si(**100**) wafers. Characterization of the Ti-**Ta**-O films was done using X-ray diffraction (XRD), X-ray photoelectron spectroscopy (XPS), Rutherford backscattering spectrometry (RBS), and Atomic Force Microscopy (AFM). Properties investigated include Hall parameters, contact angle between the simulated body liquids and film **surface**, and mechanical properties. The results show that the position and **intensity** of X-ray diffraction **peaks** is changed by the **Ta** content. We speculate that the **Ta** results in **crystal** deformation. The **surface** topography of the films is also clearly different with different **Ta** content. Our results show that the **Ta** concentration significantly influences the properties of the films, such as Hall parameters, **surface** energy, interfacial force between film **surface** and body liquids, wear resistance, and microhardnes,s etc.

CC 932.3 Plasma Physics; 712.1 Semiconducting Materials; 804.2 Inorganic Components; 802.2 Chemical Reactions; 714.2 Semiconductor Devices and Integrated Circuits; 801 Chemistry

CT *Plasma theory; Synthesis (chemical); Silicon wafers; X ray photoelectron spectroscopy; Atomic force microscopy; X ray diffraction analysis; Ion implantation; Diamond like carbon films

ST Plasma immersion

ET C*Si; SiC; Si cp; cp; C cp; O*Ti; TiO; Ti cp; O cp; Ta; O*Ta*Ti; O sy 3; sy 3; Ta sy 3; Ti sy 3; Ti-Ta-O; D; Ta*Ti; Ta sy 2; sy 2; Ti sy 2; Ti-Ta; Si

L88 ANSWER 6 OF 55 CAPLUS

AN 2002:98877 CAPLUS

DN 136:142671

ED Entered STN: 06 Feb 2002

TI Sputtering target for giving sputter-deposited film with uniform thickness

IN Watanabe, Koichi; Watanabe, Takashi; Ishigami, Takashi

PA Toshiba Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM C23C014-34
ICS C22C028-00; G11B007-26

CC 74-12 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Section cross-reference(s): 56
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002038258	A2	20020206	JP 2000-220983	20000721
PRAI	JP 2000-220983		20000721		

AB The target uses pure Ge or Ge alloys containing 0.1-50 atomic% of B, C, Al, Si, Fe, Cr, **Ta**, Nb, Cu, Mn, Mo, W, Ni, Ti, Zr, Hf, Co, Ir and/or Ru, and the plane direction of the **surface** of the target measured by x-ray diffraction satisfies [(220) **peak intensity**]/[(111) **peak intensity**] ≥ 0.3. The target is especially suitable for forming a Ge layer, Ge compound layer, or Ge alloy layer as an intermediate layer in optical disks.

ST germanium sputtering target optical disk intermediate layer

IT Optical disks
Sputtering targets
(Ge or Ge alloy sputtering target for giving sputter-deposited film with uniform thickness in optical disk)

IT 7440-56-4, Germanium, properties 64587-24-2, Aluminum 10, germanium 90 (atomic) 72048-89-6, Germanium 80, silicon 20 (atomic) 116193-40-9, Germanium 88, molybdenum 12 (atomic) 134211-66-8, Carbon 20, germanium 80 (atomic) 143041-45-6, Germanium 90, nickel 10 (atomic) 206752-31-0, Chromium 30, germanium 70, (atomic) 354590-58-2, Copper 15, germanium 85 (atomic) 393532-93-9, Germanium 60, **tantalum** 40 (atomic) 393532-94-0, Germanium 99.5, niobium 0.5 (atomic) 393532-96-2, Germanium 92, manganese 8 (atomic) 393532-99-5, Germanium 82, tungsten 18 (atomic) 393533-00-1, Germanium 55, titanium 45 (atomic) 393533-01-2, Germanium 65, zirconium 35 (atomic) 393533-03-4, Germanium 99, hafnium 1 (atomic) 393533-05-6, Cobalt 1.5, germanium 98.5 (atomic) 393533-07-8, Boron 50, germanium 50 (atomic) 393533-09-0, Germanium 80, iridium 20 (atomic) 393533-11-4, Germanium 70, ruthenium 30 (atomic)
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(Ge or Ge alloy sputtering target for giving sputter-deposited film with uniform thickness in optical disk)

L88 ANSWER 7 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:816448 CAPLUS
DN 138:42764
ED Entered STN: 28 Oct 2002
TI Relationship between preferred orientation and stress in multilayered Au/NiCr/**Ta** films
AU Tang, Wu; Xu, Kewei; Wang, Ping; Li, Xian
CS State-Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University, Xi'an, 710049, Peop. Rep. China
SO Jinshu Xuebao (2002), 38(9), 932-935
CODEN: CHSPA4; ISSN: 0412-1961
PB Kexue Chubanshe
DT Journal
LA Chinese
CC 56-6 (Nonferrous Metals and Alloys)
Section cross-reference(s): 57

AB Au/NiCr/**Ta** multi-layered metal films were deposited onto Al2O3 substrate by magnetron sputtering and then annealed in Ar atmospheric The **crystal orientation**, residual stress, and their relationship were investigated as a function of deposition temperature The residual stress in as-deposited films was tensile and changed to compressive after samples annealing at 400 °C. It is clarified that the stress in the film plane depends on **crystal orientation.** The films with (200)-preferred orientation have the lowest compressive stress and those with (**111**)-orientation have the highest tensile one. It appears that the **intensity** ratio of diffraction **peaks** of (**111**) and (200) can be used as a figure of merit for the state of residual stress and its magnitude in the film.

ST gold multilayer film preferred orientation residual stress; **tantalum** multilayer film preferred orientation residual stress; chromium nickel multilayer film preferred orientation residual stress

IT Coating materials
(metal; relationship between preferred **crystal orientation** and residual stress in multilayered Au/NiCr/**Ta** films on Al2O3)

IT **Crystal orientation**
Multilayers
Sputtering
Texture (metallographic)
(relationship between preferred **crystal orientation** and residual stress in multilayered Au/NiCr/**Ta** films on Al2O3)

IT Stress, mechanical
(residual; relationship between preferred **crystal orientation** and residual stress in multilayered Au/NiCr/**Ta** films on Al2O3)

IT **7440-25-7, Tantalum**, processes 7440-57-5, Gold, processes 12443-21-9
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(multilayer films; relationship between preferred **crystal orientation** and residual stress in multilayered Au/NiCr/**Ta** films on Al2O3)

IT 1344-28-1, Alumina, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(substrate; relationship between preferred **crystal orientation** and residual stress in multilayered Au/NiCr/**Ta** films on Al2O3)

L88 ANSWER 8 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:586719 CAPLUS
DN 137:318590
ED Entered STN: 07 Aug 2002
TI Improvement of TaNx barrier effectiveness without Cu (**111**)

texture degradation

AU Min, Woo Sig; Pyo, Sung Gyu; Kim, Heon Do; Kim, Sibum; Lee, Tae Kwon; Park, Sang Kyun; Sohn, Hyun Chul

CS Memory Research and Development Division, Hynix Semiconductor Inc., Hungduk-gu, Cheongju-si, 361-725, S. Korea

SO Advanced Metallization Conference 2001, Proceedings of the Conference, Montreal, Canada, Oct. 8-11 and a Parallel Session of the Conference, Tokyo, Japan, Oct. 29-31, 2001 (2002), Meeting Date 2001, 619-623. Editor(s): McKerrow, Andrew J. Publisher: Materials Research Society, Warrendale, Pa.
CODEN: 69CXX3; ISBN: 1-55899-670-2

DT Conference

LA English

CC 76-3 (Electric Phenomena)

AB Air-exposure of the extremely thin ionized PVD TaNx film before deposition of the ionized PVD Cu film resulted in enormously higher thermal resistance for reaction between Cu and Si. Random orientation of the Cu film formed on the air-exposed TaNx could be avoided by another TaNx deposition on the air-exposed TaNx films before Cu deposition. It was confirmed by XRD **pole figure** technique for the electroplated Cu damascene line arrays.

ST **tantalum** nitride barrier effectiveness copper interconnection

IT Diffusion barrier
Electrodeposition
Integrated circuits
Interconnections, electric
Texture (metallographic)
Thermal resistance
Vapor deposition process
(improvement of TaNx diffusion barrier effectiveness without Cu interconnection **texture** degradation)

IT 7440-21-3, Silicon, uses 7440-50-8, Copper, uses
RL: DEV (Device component use); USES (Uses)
(improvement of TaNx diffusion barrier effectiveness without Cu interconnection **texture** degradation)

IT 12033-62-4, **Tantalum** nitride
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(improvement of TaNx diffusion barrier effectiveness without Cu interconnection **texture** degradation)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE
(1) Min, K; J Vac Sci Technol 1996, VB14, P3263
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(3) Min, W; Proceedings of the Conference in press
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L88 ANSWER 9 OF 55 CAPLUS

AN 2002:498314 CAPLUS

DN 137:193035

ED Entered STN: 02 Jul 2002

TI Structure and morphology of epitaxially intergrown (**100**)- and

(116)-oriented SrBi2Ta2O9 ferroelectric thin films on SrLaGaO4(110) substrates

AU Lee, H. N.; Zakharov, D. N.; Reiche, P.; Uecker, R.; Hesse, D.
CS Max-Planck-Institut fur Mikrostrukturphysik, Halle/Saale, D-06120, Germany

SO Materials Research Society Symposium Proceedings (2002), 688(Ferroelectric Thin Films X), 291-296
CODEN: MRSPDH; ISSN: 0272-9172
PB Materials Research Society
DT Journal
LA English
CC 75-2 (Crystallography and Liquid Crystals)

AB SrBi2Ta2O9 (SBT) epitaxial thin films having a mix of (**100**) and (116) orientations were grown on SrLaGaO4(110) by pulsed laser deposition. X-ray diffraction θ-2θ and **pole figure** scans, and cross-sectional TEM analyses revealed two epitaxial orientations, SBT(**100**) .dblvert. SLG(110); SBT[001] .dblvert. SLG[001] and SBT(116) .dblvert. SLG(110); SBT[1 10] .dblvert. SLG[001]. By calculating the integrated intensity of certain x-ray diffraction peaks, the **crystallinity** and the in-plane **orientation** of the (**100**) and (116) orientation are best at a substrate temperature of 775° and 788°, resp., and the volume fraction of the (**100**) orientation at .apprx.770° reached .apprx.60%. By scanning force microscopy and cross-sectional TEM studies the α-axis-oriented grains are rounded and protrude out due to the rapid growth along the [110] direction, leading to a distinct difference of the **surface morphol.** between (**100**)- and (116)-oriented grains.

ST structure morphol epitaxially intergrown bismuth strontium tantalate

IT **Crystal orientation**
(epitaxial; structure and **surface morphol.** of epitaxially intergrown (**100**)- and (116)-oriented SrBi2Ta2O9 ferroelec. thin films on SrLaGaO4(110) substrates)

IT Crystallinity
Surface structure
(structure and **surface morphol.** of epitaxially intergrown (**100**)- and (116)-oriented SrBi2Ta2O9 ferroelec. thin films on SrLaGaO4(110) substrates)

IT 12183-33-4, Gallium lanthanum strontium oxide (GaLaSrO4) 50811-07-9, Bismuth strontium **tantalum** oxide (Bi2SrTa2O9)
RL: PRP (Properties)
(**structure** and **surface morphol.** of epitaxially intergrown (**100**)- and (116)-oriented SrBi2Ta2O9 ferroelec. thin films on SrLaGaO4(110) substrates)

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE
(1) Choi, J; Appl Phys Lett 1999, V74, P2933 CAPLUS
(2) Dabkowski, A; J Cryst Growth 1993, V132, P205 CAPLUS
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(4) Lee, H; J Appl Phys 2000, V88, P6658 CAPLUS
(5) Lettieri, J; Appl Phys Lett 1998, V73, P2923 CAPLUS
(6) Madhaven, S; Appl Phys Lett 1996, V68, P559
(7) Miyazawa, S; Jpn J Appl Phys 1996, V35, PL1177 CAPLUS

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(11) Uecker, R; Acta Phys Pol A 1997, V92, P23 CAPLUS
(12) Wang, X; J Appl Phys 1990, V67, P4217 CAPLUS

L88 ANSWER 10 OF 55 JICST-EPlus COPYRIGHT 2004 JST on STN
AN 1020728221 JICST-EPlus
TI Characterization of TiO2 Films Prepared by Pulsed Laser Deposition.
AU YAMAMOTO SHUN'YA; SUMITA TAISHI; MIYASHITA ATSUMI; ITO HISAYOSHI
CS Japan Atomic Energy Res. Inst., JPN
SO Nippon Genshiryoku Kenkyujo JAERI,Conf, (2002) pp. 178-181. Journal Code: L2150A (Fig. 6, Tbl. 1)
Report No.: JAERI-CONF-2002-008
CY Japan
DT Conference; Article
LA Japanese
STA New
AB Epitaxial titanium dioxide thin films with anatase and rutile **structure** have been deposited by pulsed laser deposition(ArF excimer laser and Nd:YAG laser) under the controlled O2 atmosphere. Epitaxial anatase films have been prepared on several kinds of oxide substrates with different lattice parameters. The anatase TiO2(001) films have been prepared on LaAlO3(001), LSAT(001), SrTiO3(001) and YSZ(001) substrates. Also the high quality epitaxial rutile TiO2(**100**) films were grown on A-Al2O3(0001) substrate. In addition, Cr,Nb, **Ta** and W doped rutirle TiO2(**100**) films were successfully prepared. The quality of films and **crystallographic** relationships were assessed by x-ray diffraction, x-ray **pole figures** and Rutherford backscattering spectroscopy(RBS)/channeling. The photocatalytic activity was evaluated by Photo-Induced Charge Separation measurement(PITCS) and measuring decomposition rates of methylene blue. (author abst.)
CC BK14050P (539.23:54-31)
CT titanium oxide; laser deposition; atmosphere(environment); oxygen; epitaxy; substrate(plate); doping; chromium; niobium; **tantalum**; **surface structure**; X-ray diffraction; **pole figure**; Rutherford back scattering; heat treatment
BT metal oxide; oxide; chalcogenide; oxygen group element compound; oxygen compound; titanium compound; 4A group element compound; transition metal compound; physical vapor deposition; vapor deposition; laser application; utilization; environment; oxygen group element; element; second row element; **crystal** growth; thin film growth; plate classified by application; plate(material); 6A group element; transition metal; metallic element; fourth row element; 5A group element; **structure**; X-ray scattering; electromagnetic wave scattering; scattering; diffraction; coherent scattering; diagram and table; Rutherford scattering; elastic scattering; backward scattering; treatment

L88 ANSWER 11 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:579211 CAPLUS
DN 137:266432

ED Entered STN: 05 Aug 2002
TI Effect of diffusion barrier on **surface morphology** and
structure of Cu-Zr alloy films
AU Song, Zhong-xiao; Tang, Wu; Xu, Ke-wei
CS State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong
University, Xi'an, 710049, Peop. Rep. China
SO Gongneng Cailiao Yu Qijian Xuebao (2002), 8(2), 119-122
CODEN: GCQXFW; ISSN: 1007-4252
PB Gongneng Cailiao Yu Qijian Xuebao Bianjibu
DT Journal
LA Chinese
CC 56-6 (Nonferrous Metals and Alloys)
Section cross-reference(s): 57
AB Cu-Zr alloy films were deposited on TiN, TaN, and ZrN diffusion barriers
with co-sputtering technol. that combined magnetron sputtering and ion
beam sputtering. The films were annealed at 400°C for 1h in N2.
After annealing, Zr in the film diffuses to the surface and the interface,
and the **surface morphol.** and particle size vary with
different diffusion barriers. The films on ZrN diffusion barrier has the
smallest particle size. The as-deposited Cu-Zr alloy films have a strong
(111) texture and broadened peaks. After annealing,
the Cu-Zr alloy films become less oriented. There appear (200), (220),
and (311) peaks, besides the **(111) peak** and the
integrated **intensity** ratio of (200)/(**111**) is different
for different film/barrier system.
ST copper zirconium film deposition nitride substrate diffusion barrier;
tantalum nitride diffusion barrier copper zirconium alloy
deposition; titanium nitride diffusion barrier copper zirconium alloy
deposition; zirconium nitride diffusion barrier copper zirconium alloy
deposition
IT Sputtering
Surface structure
Texture (metallographic)
(effect of nitride diffusion barrier on **surface
morphol.** and structure of Cu-Zr alloy sputter-deposited films)
IT Grain size
(substrate effect on; effect of nitride diffusion barrier on
surface morphol. and structure of Cu-Zr alloy
sputter-deposited films)
IT 12033-62-4, **Tantalum** nitride 25583-20-4, Titanium nitride
25658-42-8, Zirconium nitride
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP
(Physical process); TEM (Technical or engineered material use); PROC
(Process); USES (Uses)
(diffusion barrier substrate; effect of nitride diffusion barrier on
surface morphol. and **structure** of Cu-Zr
alloy sputter-deposited films)
IT 115675-51-9, Copper 95, zirconium 5 (atomic)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP
(Physical process); TEM (Technical or engineered material use); PROC
(Process); USES (Uses)
(effect of nitride diffusion barrier on **surface**

morphol. and structure of Cu-Zr alloy sputter-deposited films)

L88 ANSWER 12 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 2
AN 2002:489498 CAPLUS
DN 137:223368
ED Entered STN: 30 Jun 2002
TI Residual stress and microstructure of electroplated Cu film on different barrier layers
AU Volinsky, Alex A.; Hauschildt, Meike; Vella, Joseph B.; Edwards, N. V.; Gregory, Rich; Gerberich, William W.
CS Process and Materials Characterization Lab, Motorola DigitalDNA Labs, Mesa, AZ, USA
SO Materials Research Society Symposium Proceedings (2002), 695(Thin Films: Stresses and Mechanical Properties IX), 27-32
CODEN: MRSPDH; ISSN: 0272-9172
PB Materials Research Society
DT Journal
LA English
CC 72-8 (Electrochemistry)
Section cross-reference(s): 56, 76
AB Copper films of different thicknesses between 0.2 and 2 μ were electroplated on adhesion-promoting TiW and **Ta** barrier layers on <**100**> single crystal 6-in. silicon wafers. The residual stress was measured after each processing step using a wafer curvature technique employing Stoney's equation. Large gradients in the stress distributions were found across each wafer. Controlled Cu **grain** growth was achieved by annealing films at 350° for 3 min in high vacuum. Annealing increased the average tensile residual stress by .apprx.200 MPa for all the films, which is in agreement with stress-temperature cycling measurements. After aging for 1 yr wafer stress mapping showed that the stress gradients in the copper films were alleviated. No stress discrepancies between the copper on **Ta** and TiW barrier layers could be found. However, x-ray **pole figure** anal. showed broad and shifted (**111**) **texture** in films on a TiW underlayer, whereas the (**111**) **texture** in Cu films on **Ta** is sharp and centered.
ST residual stress microstructure electroplated copper film different barrier layer; silicon wafer barrier layer copper electrodeposit residual stress microstructure
IT **Crystal orientation**
Microstructure
(Cu electroplated film on adhesion-promoting TiW and **Ta** barrier layers on single crystal silicon wafers)
IT Thickness
(of Cu electroplated film on adhesion-promoting TiW and **Ta** barrier layers on single crystal silicon wafers)
IT Annealing
(of Cu electroplated film on adhesion-promoting TiW and **Ta** barrier layers on single crystal silicon wafers in residual stress study)
IT Electrodeposits
(residual stress and **microstructure** of electroplated Cu film

on adhesion-promoting TiW and **Ta** barrier layers on single
crystal silicon wafers)
IT Stress, mechanical
(residual; Cu electroplated film on adhesion-promoting TiW and
Ta barrier layers on single crystal silicon wafers)
IT 7440-50-8, Copper, properties
RL: CPS (Chemical process); PEP (Physical, engineering or chemical
process); PRP (Properties); PROC (Process)
(residual stress and **microstructure** of electroplated Cu film
on adhesion-promoting TiW and **Ta** barrier layers on single
crystal silicon wafers)
IT 7440-21-3, Silicon, uses **7440-25-7**, **Tantalum**, uses
51637-35-5, TiW
RL: DEV (Device component use); PEP (Physical, engineering or chemical
process); PRP (Properties); PYP (Physical process); PROC (Process); USES
(Uses)
(residual stress and **microstructure** of electroplated Cu film
on adhesion-promoting TiW and **Ta** barrier layers on single
crystal silicon wafers)
RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
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L88 ANSWER 13 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2001:145121 CAPLUS
DN 134:166720
ED Entered STN: 28 Feb 2001
TI Hot-rolled **Ta strip** for fabrication of fine-grained
targets for cathodic **sputtering** in electronic applications
IN Zhang, Hao
PA Tosoh SMD, Inc., USA
SO U.S., 8 pp.

CODEN: USXXAM
DT Patent
LA English
IC ICM C22F001-18
NCL 148668000
CC 56-11 (Nonferrous Metals and Alloys)
Section cross-reference(s): 76
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6193821	B1	20010227	US 1999-353700	19990714
PRAI	US 1998-97153P	P	19980819		

AB High-purity **Ta** billet is forged to manufacture a **strip** with side rolling for transverse reduction of 70-85% from the centerline (preferably at 25-400°), followed by: (a) annealing in vacuum at 900-1200°; (b) upset forging the **strip** at preferably 25-400° and 90-99% reduction to a plate having square-section shape; (c) vacuum annealing at 900-1200°; and (d) machining the annealed plate to manufacture a round **sputtering** target. The resulting target has fine grain size of 20-25 μm, and crystallog., **texture** suitable for increased **sputtering** in deposition of uniform **Ta** films on elec. integrated circuits.

ST **sputtering tantalum** target manuf ingot forging; elec circuit **tantalum sputtering** target manuf

IT Integrated circuits
(**Ta** films on; **Ta**-ingot **strip** as fine-grained target for cathodic film **sputtering** on electronic apparatus)

IT **Sputtering** targets
(**Ta**-ingot **strip** as fine-grained target for cathodic film **sputtering** on electronic apparatus)

IT Cast alloys
RL: TEM (Technical or engineered material use); USES (Uses)
(**Ta**; **Ta**-ingot **strip** as fine-grained target for cathodic film **sputtering** on electronic apparatus)

IT Forging
(of **Ta**; **Ta**-ingot **strip** as fine-grained target for cathodic film **sputtering** on electronic apparatus)

IT **7440-25-7**, **Tantalum**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**sputtering** target; **Ta**-ingot **strip** as fine-grained target for cathodic film **sputtering** on electronic apparatus)

RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE
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(6) Dunn; US 3335037 1967 CAPLUS
(7) Fujita; US 3818746 1974

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L88 ANSWER 14 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2001:754329 CAPLUS
DN 136:46541
ED Entered STN: 17 Oct 2001
TI Synthesis and properties of highly oriented (Sr,Ba)(Nb,**Ta**)2O6 thin films by chemical solution deposition
AU Sakamoto, Wataru; Horie, Yu-saku; Yogo, Toshinobu; Hirano, Shin-ichi
CS Department of Apphed Chemistry, Graduate School of Engineering, Nagoya University, Nagoya, 464-8603, Japan
SO Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes & Review Papers (2001), 40(9B), 5599-5604
CODEN: JAPNDE
PB Japan Society of Applied Physics
DT Journal
LA English
CC 76-8 (Electric Phenomena)
Section cross-reference(s): 75
AB Transparent and highly oriented (Sr,Ba)(Nb,**Ta**)2O6 (SBNT) thin films have been synthesized by a chemical solution deposition method. A homogeneous and stable SBNT precursor solution was prepared by controlling the reaction of metal alkoxides in solution and by optimizing the additive as a stabilizing agent. **Tantalum**-substituted (Sr0.5Ba0.5)(Nb0.8Ta0.2)2O6 powders and thin films, such as (Sr0.5Ba0.5)(Nb0.5Ta0.5)2O6 (SBNT50/50) and (Sr0.5Ba0.5)(Nb0.8Ta0.2)2O6 (SBNT50/80), directly crystallized into the tetragonal tungsten bronze phase at 700°C. The synthesized SBNT thin films on MgO(**100**) and Pt(**100**)/MgO(**100**) had a prominent c-axis-preferred orientation. Two crystal lattice planes of SBNT were found to intergrow at an orientation of 18.5° on MgO(**100**) and Pt(**100**)/MgO(**100**) substrates by x-ray **pole figure** measurement. The SBNT50/80 and SBNT50/50 thin films on Pt(**100**)/MgO(**100**) were paraelec. at room temperature and showed diffuse phase transition of the ε-T curves.
ST strontium barium niobate tantalate tungsten bronze
IT Crystal **structure**
Ferroelectric transition
(synthesis and properties of highly oriented (Sr,Ba)(Nb,**Ta**)2O6 thin films by chemical solution deposition)
IT 1309-48-4, Magnesium oxide (MgO), properties 7440-06-4, Platinum, properties
RL: PRP (Properties)
(substrate; synthesis and properties of highly oriented (Sr,Ba)(Nb,**Ta**)2O6 thin films by chemical solution deposition)
IT 120605-05-2P, Barium niobium strontium **tantalum** oxide

(Ba0.5Nb1.6Sr0.5Ta0.4O6) 380412-16-8P, Barium niobium strontium **tantalum** oxide (Ba0.5NbSr0.5TaO6)
RL: PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation)
(synthesis and properties of highly oriented (Sr,Ba)(Nb,**Ta**)2O6 thin films by chemical solution deposition)
IT 11083-77-5, Tungsten bronze
RL: PRP (Properties)
(synthesis and properties of highly oriented (Sr,Ba)(Nb,**Ta**)2O6 thin films by chemical solution deposition)
RE.CNT 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L88 ANSWER 15 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2001:679639 CAPLUS
DN 135:361268
ED Entered STN: 17 Sep 2001
TI Interfacial reaction pathways and kinetics during annealing of 111**-textured** Al/TiN bilayers: A synchrotron x-ray diffraction and transmission electron microscopy study
AU Chun, J.-S.; Desjardins, P.; Lavoie, C.; Petrov, I.; Cabral, C., Jr.; Greene, J. E.
CS Material Science Department and Frederick Seitz Materials Research Laboratory, University of Illinois, Urbana, IL, 61801, USA
SO Journal of Vacuum Science & Technology, A: Vacuum, Surfaces, and Films (2001), 19(5), 2207-2216
CODEN: JVTAD6; ISSN: 0734-2101
PB American Institute of Physics
DT Journal
LA English
CC 57-2 (Ceramics)

Section cross-reference(s): 56, 76

AB Growth of TiN layers in most diffusion-barrier applications is limited to deposition temps. Ts .ltorsim.500°C. We have grown polycryst. TiN layers, 160 nm thick with a N/Ti ratio of 1.02 ±0.03 and a **111 texture**, at Ts = 450°C on SiO2 by ultrahigh vacuum reactive magnetron sputter deposition in pure N2. Al overlayers, 160 nm thick with inherited **111** preferred orientation, were then deposited at Ts = **100**.degree.C without breaking vacuum. The as-deposited TiN layer is underdense due to the low deposition temperature (Ts/Tm .simeq.0.23 in which Tm is the m.p.) resulting in kinetically limited adatom mobilities leading to atomic shadowing which, in turn, results in a columnar **microstructure** with both inter- and intracolumnar voids. The Al overlayer is fully dense. Synchrotron x-ray diffraction was used to follow interfacial reaction kinetics during post-deposition annealing of the **111-textured** Al/TiN bilayers as a function of time (**ta** = 12-1200 s) and temperature (**Ta** = 440-550°C). Changes in bilayer **microstructure** and microchem. were investigated by TEM and scanning TEM to obtain compositional maps of plan-view and cross-sectional specimens. Interfacial reaction during annealing is initiated at the Al/TiN interface. Al diffuses rapidly into TiN voids during anneals at .apprx.480°C. In contrast, anneals at higher temps. lead to the formation of a continuous nanocryst. AlN layer which blocks Al penetration into TiN. At all annealing temps., Ti atoms released during AlN formation react with Al to form tetragonal Al3Ti at the interface. Al3Ti exhibits a relatively planar growth front extending toward the Al free **surface.** Analyses of time-dependent x-ray diffraction **peak intensities** during isothermal annealing as a function of temperature show that Al3Ti growth kinetics are, for the entire temperature range investigated, diffusion limited with an activation energy of 1.5 ±0.2 eV.

ST aluminum titanium nitride bilayer interface reaction pathway kinetics

IT Activation energy
(Al3Ti growth; x-ray diffraction and TEM study of interfacial reaction pathways and kinetics during annealing of **111-textured** Al/TiN bilayers)

IT Interconnections (electric)
(aluminum; x-ray diffraction and TEM study of interfacial reaction pathways and kinetics during annealing of **111-textured** Al/TiN bilayers)

IT Diffusion barrier
(titanium nitride; x-ray diffraction and TEM study of interfacial reaction pathways and kinetics during annealing of **111-textured** Al/TiN bilayers)

IT Annealing
Crystal orientation
Diffusion
(x-ray diffraction and TEM study of interfacial reaction pathways and kinetics during annealing of **111-textured** Al/TiN bilayers)

IT 7429-90-5, Aluminum, processes 25583-20-4, Titanium nitride
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(bilayers, Al/TiN; x-ray diffraction and TEM study of interfacial reaction pathways and kinetics during annealing of **111-textured** Al/TiN bilayers)

IT 12004-78-3 24304-00-5, Aluminum nitride (AlN)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(interface reaction phase; x-ray diffraction and TEM study of interfacial reaction pathways and kinetics during annealing of **111-textured** Al/TiN bilayers)

IT 7631-86-9, Silica, uses
RL: NUU (Other use, unclassified); USES (Uses)
(substrate; x-ray diffraction and TEM study of interfacial reaction pathways and kinetics during annealing of **111-textured** Al/TiN bilayers)

RE.CNT 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE
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L88 ANSWER 16 OF 55 CAPLUS
AN 2002:385973 CAPLUS
DN 137:102010
ED Entered STN: 23 May 2002
TI High resolution **texture** analysis of thin blanket films and discreet test structures in semiconductor devices
AU Kozaczek, K. J.; Martin, R. I.; Kurtz, D. S.; Moran, P. R.; O'Leary, S. P.; Martin, R. L.
CS HyperNex, Inc., State College, PA, 16801, USA
SO Advances in X-Ray Analysis (2001), Volume Date 2000, 44, 314-319
CODEN: AXRAAA; ISSN: 0376-0308

PB International Centre for Diffraction Data
DT Journal; (computer optical disk)
LA English
CC 76-3 (Electric Phenomena)
Section cross-reference(s): 75

AB Traditional **texture** anal. by XRD has two drawbacks when applied to semiconductor test structures on a full size wafer: it lacks precision in positioning of a small diameter x-ray beam with respect to small, discreet test structures (hundreds of microns or less) on a large wafer, and it lacks appropriate algorithms for calculating the orientation **distribution function** in the case of very sharp **textures.** The authors present a method that overcomes these two drawbacks. This particular measurement protocol eliminates the sample chi rotation thus enabling **texture** anal. on a wafer with in-plane motion only. The wafer positioning is controlled by high precision motion stages and a high magnification video camera. Such an arrangement allows one to measure **texture** anywhere on a full size wafer with a spatial resolution of .apprx.**100** μm. Several incomplete **pole figures** are collected simultaneously from one or more phases present in the sample and the orientation **distribution function** is calculated with a resolution ≤1 degree. Examples of quant. **texture** anal. in blanket films and interconnects are presented.

ST **texture** analysis x ray diffractometry semiconductor device

IT Algorithm
Interconnections, electric
Microstructure
Semiconductor devices
Testing of materials
Texture (metallographic)
X-ray diffractometry
(high resolution **texture** anal. of thin blanket films and discreet test structures in semiconductor devices using x-ray diffraction)

IT **7440-25-7, Tantalum**, properties 7440-50-8, Copper, properties
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(high resolution **texture** anal. of thin blanket films and discreet test **structures** in semiconductor devices using x-ray diffraction)

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE
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L88 ANSWER 17 OF 55 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2000-614909 [59] WPIX
CR 2000-535334 [43]
DNN N2000-455499 DNC C2000-184540
TI Raw alloy of nano-composite magnets and its powder, nano-composite magnet powder, and the method manufacturing them.
DC L03 M22 M27 P53 V02
IN HIROSAWA, S; KANEKIYO, H; SHIGEMOTO, Y
PA (SUMS) SUMITOMO SPECIAL METALS CO LTD
CYC 3
PI JP 2000234137 A 20000829 (200059)* 22p C22C033-02
CN 1257289 A 20000621 (200059) H01F001-055
US 6302972 B1 20011016 (200164) H01F001-057
ADT JP 2000234137 A JP 1999-291439 19990906; CN 1257289 A CN 1999-125410 19991207; US 6302972 B1 US 1999-455469 19991206
PRAI JP 1998-346700 19981207; JP 1998-356286 19981215
IC ICM C22C033-02; H01F001-055; H01F001-057
ICS B22F001-00; B22F003-00; C22C038-00; H01F001-053; H01F001-06
AB JP2000234137 A UPAB: 20001117

NOVELTY - Fe-R-B, Fe-R-B-Co, Fe-R-B-M, or Fe-R-B-Co-M system alloy, where R is made (as weight %) of more than 90 of (one or both of Pr and Nd) and 0-(less than 10) of at least one element of lanthanides (except Pr and Nd) and Y, and M is at least one of Al, Si, Ti, V, Cr, Mn, Ni, Cu, Ga, Zr, Nb, Mo, Hf, **Ta**, W, Pt, Au, and Ag.

DETAILED DESCRIPTION - Detailed composition of the alloy is Fe(**100**-x-y)RxBy, Fe(RxByCoz, Fe(**100**-x-y-z)**100** -x-y-u)RxByMu, or Fe(**100**-x-y-z-u)RxByCozMu, where x is equal to or larger than 2 and equal to or less than 6, y is equal to or larger than 16 and equal to or less than 20, z is equal to or larger than 0.2 and equal to or less than 7, and u is equal to or larger than 0.01 and equal to or less than 7. The alloy containing meta-stable phase (Z) whose Bragg's reflection peak of in X-ray diffraction is caused by its 0.179 nm plus minus 0.005 nm lattice spacing and its intensity is 5-200 % of the intensity of hallow **pattern.** Bragg's scattering **peak intensity** of (110) plane of body centered cubic type Fe is less than 5 % of the hallow **pattern** intensity.

USE - Used as nano composite magnets.

ADVANTAGE - This method is able to control micro **crystallization** so that by thermal treatment of magnetization homogeneous and micro metal **texture** can be obtained.

DESCRIPTION OF DRAWING(S) - The figure shows the X-ray diffraction trace of the magnetic alloy.

Dwg.1/5
FS CPI EPI GMPI
FA AB; GI
MC CPI: L03-B02A2; M22-H01; M27-A; M27-A00X
EPI: V02-A01A1

L88 ANSWER 18 OF 55 CAPLUS
AN 2000:130599 CAPLUS
DN 132:230580
ED Entered STN: 25 Feb 2000
TI **Texture** development of blanket electroplated copper films
AU Lingk, C.; Gross, M. E.; Brown, W. L.
CS Bell Labs, Lucent Technologies, Murray Hill, NJ, 07974, USA
SO Journal of Applied Physics (2000), 87(5), 2232-2236
CODEN: JAPIAU; ISSN: 0021-8979
PB American Institute of Physics
DT Journal
LA English
CC 76-14 (Electric Phenomena)
Section cross-reference(s): 56, 72
AB The transition from sputtered Al to electroplated Cu interconnects for future microelectronic devices led to an interest in understanding the relations between the microstructure and **texture** of Cu that might impact elec. performance, similar to what was done for Al. Electroplated Cu undergoes a recrystn. at room temperature that is related to the presence of organic and inorg. additives in the plating bath. As plated, the Cu grains are small (.apprx.0.1 μm) and equiaxed, but over a period of hours to days, recrystn. results in grains several microns in size. A significant weakening of the strong as-plated **(111)** **texture** was observed by x-ray diffraction **pole** **figure** measurements and an increase in the level of randomness. Multiple twinning is proposed as the leading mechanism for this phenomenon.
ST **texture** development electroplated copper film; electroplating copper film **texture** development; interconnect electroplating copper film **texture** development
IT **Texture** (metallographic)
(development of blanket electroplated copper films)
IT Interconnections (electric)
(**texture** development of blanket electroplated copper films)
IT 7631-86-9, Silica, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(**texture** development of blanket electroplated copper films on **tantalum** nitride phys. vapor deposited and silica-coated silicon wafer)
IT 12033-62-4P, **Tantalum** nitride
RL: PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PREP (Preparation); PROC (Process)
(**texture** development of blanket electroplated copper films on **tantalum** nitride phys. vapor deposited and silica-coated silicon wafer)
IT 7440-21-3, Silicon, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(**texture** development of blanket electroplated copper films on **tantalum** nitride phys. vapor deposited and silica-coated wafer of)
IT 7440-50-8P, Copper, properties
RL: PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation)

(**texture** development of blanket electroplated films of)
RE.CNT 33 THERE ARE 33 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L88 ANSWER 19 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2000:530547 CAPLUS
DN 133:241278
ED Entered STN: 03 Aug 2000
TI On the strengthening of Ni3Al by hafnium additions
AU Kruml, T.; Martin, J. L.; Bonneville, J.
CS Institute of Physics of Materials, Academy of Sciences, Brno, 61662, Czech Rep.
SO Philosophical Magazine A: Physics of Condensed Matter: Structure, Defects and Mechanical Properties (2000), 80(7), 1545-1566
CODEN: PMAADG; ISSN: 0141-8610
PB Taylor & Francis Ltd.

DT Journal
LA English
CC 56-12 (Nonferrous Metals and Alloys)
AB To interpret the notable strengthening of Ni3Al due to Hf addns. in the strength anomaly domain, the dislocation features of a 3 atomic% Hf compound were characterized. Since the general **microstructure** does not exhibit obvious differences from that observed in similar compds., the super-dislocation core was studied to find reasons for this effect. Various weak beam conditions were tested which never yield >3 **peaks** for the **intensity** profiles. The latter were interpreted for the chosen g,ng conditions (with 3 <n <6) after extensive computer image simulations. The different fault energies related to the core were determined and are .gamma.**111** = 300, γ010 = 250 mJ/m2 at 300 K while the dislocation core energy on the complex stacking fault (γCSF) exhibits very high values ($\geq$460 mJ/m2). This explains the peculiar dislocation images. A comparison of the flow stress-temperature plots with those corresponding to a binary and a 1 atomic% **Ta** compds. confirms that the shifts observed for the flow stress in the anomaly domain and those for the peak temperature can be correlated well with the γCSF values, but not with the antiphase boundary anisotropy ratio. The γCSF appears to be the key parameter for dislocation locking in the strength anomaly domain. Other solid solution strengthening effects operate in addition, without hindering the effect of γCSF. This interpretation of the differences in mech. properties agrees with previous studies on similar compds., but it holds even when these differences are large. In addition it is strongly supported by data about dislocation exhaustion rates which are measured in the Hf, the **Ta** and the binary compds. through repeated load relaxation expts. at 575 K. The high ability of superpartials to cross-slip in this large γCSF Hf compound also explains the rather large min. dislocation **character** observed for dislocations lying on the octahedral plane.
ST hafnium strengthening nickel aluminide anomaly domain dislocation
IT Crystal dislocations
Microstructure
Strength
(strengthening of Ni3Al by hafnium addns.)
IT 110924-16-8, Aluminum 21.9, hafnium 3.3, nickel 74.8 (atomic)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(strengthening of Ni3Al by hafnium addns.)
RE.CNT 27 THERE ARE 27 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L88 ANSWER 20 OF 55 CAPLUS
AN 2000:176505 CAPLUS
DN 132:272564
ED Entered STN: 19 Mar 2000
TI Variation of orientation and morphology of epitaxial SrBi2Ta2O9 and SrBi2Nb2O9 thin films via the coating-pyrolysis process
AU Nagahama, T.; Manabe, T.; Yamaguchi, I.; Kumagai, T.; Mizuta, S.; Tsuchiya, T.
CS National Institute of Materials and Chemical Research, Tsukuba, 305-8565, Japan
SO Journal of Materials Research (2000), 15(3), 783-792
CODEN: JMREEE; ISSN: 0884-2914
PB Materials Research Society
DT Journal
LA English
CC 76-8 (Electric Phenomena)
AB Orientation-controlled epitaxial thin films of Bi layer-structured ferroelecs., SrBi2Ta2O9 (SBT) and SrBi2Nb2O9 (SBN), were prepared on single-crystal SrTiO3 (STO) substrates by the coating-pyrolysis process. Most of the SBT (SBN) films showed the (106) and (001) orientations on STO(110) and (001), resp. The degree of orientation, in terms of the ratio of **peak intensity** to the background level in the x-ray diffraction ϕ-scan profile for the film, greatly increased with a decrease in the O partial pressure, p(O2), of annealing atmospheric at 800°. Coexistence of the (110)-oriented grains with the (106)-oriented ones on STO(110) [and the **(100)**-oriented grains with the (001)-oriented ones on STO(001)] was observed exclusively in the SBT films annealed at 700-750° under p(O2) of 10 Pa. Atomic force microscopy observations showed that the **surface morphol**. of the SBT films remained almost unchanged, i.e., comprising round-shaped grains of submicrometer size, whereas that of the SBN films drastically changed, according to the variation in orientation of substrate surfaces or in annealing conditions, i.e., temperature, p(O2), and

time.
ST microstructure bismuth strontium tantalate niobate ferroelec film
IT Temperature
Time
(annealing; variation of orientation and morphol. of epitaxial bismuth strontium **tantalum** oxide and bismuth niobium strontium oxide thin films via coating-pyrolysis process)
IT Partial pressure
(oxygen; variation of orientation and morphol. of epitaxial bismuth strontium **tantalum** oxide and bismuth niobium strontium oxide thin films via coating-pyrolysis process)
IT Coating process
(pyrolytic; variation of orientation and morphol. of epitaxial bismuth strontium **tantalum** oxide and bismuth niobium strontium oxide thin films via coating-pyrolysis process)
IT Coating process
(spin; variation of orientation and morphol. of epitaxial bismuth strontium **tantalum** oxide and bismuth niobium strontium oxide thin films via coating-pyrolysis process)
IT Annealing
Crystal orientation
Crystallinity
Epitaxial films
Ferroelectric films
Microstructure
Surface structure
(variation of **orientation** and morphol. of epitaxial bismuth strontium **tantalum** oxide and bismuth niobium strontium oxide thin films via coating-pyrolysis process)
IT 12060-59-2, Strontium titanate ($SrTiO_3$)
RL: NUU (Other use, unclassified); USES (Uses)
(substrate; variation of orientation and morphol. of epitaxial bismuth strontium **tantalum** oxide and bismuth niobium strontium oxide thin films via coating-pyrolysis process)
IT 50811-07-9, Bismuth strontium **tantalum** oxide ($Bi_2SrTa_2O_9$)
51403-91-9, Bismuth niobium strontium oxide ($Bi_2Nb_2SrO_9$)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(variation of orientation and morphol. of epitaxial bismuth strontium **tantalum** oxide and bismuth niobium strontium oxide thin films via coating-pyrolysis process)
IT 7782-44-7, Oxygen, properties
RL: PRP (Properties)
(variation of orientation and morphol. of epitaxial bismuth strontium **tantalum** oxide and bismuth niobium strontium oxide thin films via coating-pyrolysis process)
RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L88 ANSWER 21 OF 55 CAPLUS
AN 2000:874840 CAPLUS
DN 134:134859
ED Entered STN: 14 Dec 2000
TI Image plate X-ray diffraction and X-ray reflectivity characterization of protective coatings and thin films
AU Lee, S. L.; Windover, D.; Doxbeck, M.; Nielsen, M.; Kumar, A.; Lu, T.-M.
CS Development and Engineering Center, Benet Labs, US Army Armament Research, Watervliet, NY, 12189, USA
SO Thin Solid Films (2000), 377-378, 447-454
CODEN: THSFAP; ISSN: 0040-6090
PB Elsevier Science S.A.
DT Journal
LA English
CC 56-6 (Nonferrous Metals and Alloys)
Section cross-reference(s): 47
AB Two-dimensional image plate applications in x-ray diffraction (x-ray diffraction) and x-ray reflectivity (XRR) characterization, using a grazing incidence geometry and radiation from a conventional x-ray tube, were explored. X-ray diffraction and XRR data obtained from a conventional diffractometer using a Si (Li) detector complement image plate results to give more complete phase and **structure** information. Protective chromium coatings, electrochem. deposited onto the bore of steel cylinders, were investigated. Retained austenite content in martensitic steel was measured in simulated, inside-diameter, bore geometry. This approach demonstrates the versatility of the method for non-destructive chemical anal. and phase differentiation of interior bore **surfaces** in piping **structures.** MATLAB-based processing software was developed to facilitate quant. image anal., including multiple 2θ scans, χ-plots, and **pole figure** re-construction from multiple-.vphi. images, where χ and ϕ designate, resp., specimen tilt and rotation. For XRR applications, a 12-nm **tantalum** and an 82-nm **tantalum** oxide thin film sputtered on **(100)**-oriented silicon wafers were investigated.

D. and thin film thickness were obtained from specular reflectivity modeling involving the periodicity of the interference fringes. Two-dimensional Kiessig interference-fringe images were analyzed and compared with conventional specular XRR for the measurement of thin film thickness and thickness uniformity over a sample.

ST image plate x ray reflectivity protective chromium coating film

IT Interference
  (fringe; image plate x-ray diffraction and x-ray reflectivity characterization of protective coatings and thin films)

IT Cylinders
  Ultrathin films
  (image plate x-ray diffraction and x-ray reflectivity characterization of protective coatings and thin films)

IT Optical reflection
  (x-ray; image plate x-ray diffraction and x-ray reflectivity characterization of protective coatings and thin films)

IT 7440-47-3, Chromium, properties
  RL: PRP (Properties)
  (coating; image plate x-ray diffraction and x-ray reflectivity characterization of protective coatings and thin films)

IT 1314-61-0, **Tantalum** oxide 7440-25-7, **Tantalum**, processes 12597-69-2, Steel, processes
  RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
  (image plate x-ray diffraction and x-ray reflectivity characterization of protective coatings and thin films)

IT 12244-31-4, Austenite, properties
  RL: FMU (Formation, unclassified); PRP (Properties); FORM (Formation, nonpreparative)
  (retained; image plate x-ray diffraction and x-ray reflectivity characterization of protective coatings and thin films)

RE.CNT 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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L88 ANSWER 22 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1999:811413 CAPLUS
DN 132:39094
ED Entered STN: 24 Dec 1999
TI High-purity **tantalum strip** manufactured with uniform microstructure and **texture** for **sputtering** targets
IN Shah, Ritesh P.; Segal, Vladimir
PA Johnson Matthey Electronics, Inc., USA
SO PCT Int. Appl., 15 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM C23C014-34
ICS C22C027-02; B21C001-00; B32B015-01
CC 56-11 (Nonferrous Metals and Alloys)
Section cross-reference(s): 51
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9966100	A1	19991223	WO 1998-US18676	19980908
	W: CN, DE, GB, JP, KR, SE, SG				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	US 6348139	B1	20020219	US 1998-98760	19980617
	EP 1088115	A1	20010404	EP 1998-945933	19980908
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
	JP 2002518593	T2	20020625	JP 2000-554901	19980908
	TW 515848	B	20030101	TW 1999-88106727	19990427
	US 2002063056	A1	20020530	US 2001-14310	20011211
	US 2002153248	A1	20021024	US 2002-122042	20020412
PRAI	US 1998-98760	A	19980617		
	WO 1998-US18676	W	19980908		
	US 2001-14310	A3	20011211		

AB The **Ta** billet of ≥99.95% purity is processed by frictionless forging to manufacture a **sputtering** target having fine-grained uniform microstructure and cubic crystallog. **texture**. The **Ta** billet is preferably forged by cold upsetting in a press lined with polymer-film lubricant, processed by rolling in different directions, and then is finished by recrystn. annealing.
ST **tantalum sputtering** target manuf billet forging; polymer film lubricant **tantalum** billet forging
IT Recrystallization
(annealing; **tantalum strip** with uniform microstructure and **texture** annealed for **sputtering** targets)
IT Forging
(frictionless; **tantalum strip** with uniform microstructure and **texture** forged for **sputtering**

targets)

IT Lubricants
(polymer film; **tantalum** billet forged with polymer film lubricant for uniform microstructure and **texture** in annealed **sputtering** targets)

IT **Sputtering** targets
(**tantalum strip** with uniform microstructure and **texture** for **sputtering** targets)

IT **7440-25-7**, **Tantalum**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**sputtering** targets; **tantalum strip** with uniform microstructure and **texture** for **sputtering** targets)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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L88 ANSWER 23 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN

AN 1999:119302 CAPLUS

DN 130:230425

ED Entered STN: 23 Feb 1999

TI **Texture** analysis of damascene-fabricated Cu lines by x-ray diffraction and electron backscatter diffraction and its impact on electromigration performance

AU Vanasupa, Linda; Joo, Young-Chang; Besser, Paul R.; Pramanick, Shekhar

CS AMD, MS 143, Sunnyvale, CA, 94088-3453, USA

SO Journal of Applied Physics (1999), 85(5), 2583-2590
CODEN: JAPIAU; ISSN: 0021-8979

PB American Institute of Physics

DT Journal

LA English

CC 76-2 (Electric Phenomena)
Section cross-reference(s): 56

AB The **texture** of electroplated Cu lines of 0.375, 0.5 and 1.5 μm widths with **Ta** and TiN barrier layers was analyzed using x-ray **pole figure** and electron backscatter diffraction (EBSD) techniques. Both techniques indicate a strong **(111)** fiber **texture** relative to the bottom **surface** of the trench for samples with a **Ta** barrier layer and a 400°, 30 min, postelectroplating anneal. Samples with a TiN barrier and no anneal exhibit a weak **(111)** **texture.** For both barrier layers the quality of the **texture**, as measured by (111) **peak intensity**, fraction of randomly oriented **grains** and **(111)** peak width, degrades with decreasing linewidth. EBSD data also indicate **(111)** **texture** relative to the sidewalls of the trench in samples with a **Ta** barrier and postelectroplating anneal. Electromigration tests at 300° of 0.36 μm damascene Cu lines with the same process

conditions show that samples with very weak **(111)**
texture have median time to failures that exceed those of the
strongly **textured** Cu lines. Diffusion at interfaces, such as
the Cu/barrier and Cu/overlayer interfaces, along with diffusion along an
electroplating seam play more dominant roles in electromigration failure
in damascene-fabricated lines than diffusion along **grain**
boundaries within the interconnect.

ST **texture** copper line electromigration

IT Diffusion
(surface, interface; **texture** of copper lines and its impact
on electromigration in relation to)

IT Electric failure
Electrodeposits
Electrodiffusion
Interconnections (electric)
Metal lines
Texture (metallographic)
(**texture** of copper lines and its impact on electromigration)

IT **7440-25-7**, **Tantalum**, uses 25583-20-4, Titanium nitride
(TiN)
RL: NUU (Other use, unclassified); USES (Uses)
(barrier layer; **texture** of copper lines on barrier layers and
its impact on electromigration)

IT 7440-50-8, Copper, properties
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM
(Technical or engineered material use); PROC (Process); USES (Uses)
(**texture** of copper lines and its impact on electromigration)

RE.CNT 45 THERE ARE 45 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L88 ANSWER 24 OF 55 CAPLUS
AN 1999:408815 CAPLUS
DN 131:173610
ED Entered STN: 02 Jul 1999
TI Processing of oriented K(**Ta**,Nb)O3 films using chemical solution deposition
AU Suzuki, Kazuyuki; Sakamoto, Wataru; Yogo, Toshinobu; Hirano, Shin-Ichi
CS Department of Applied Chemistry, Graduate School of Engineering, Nagoya University, Nagoya, 464-8603, Japan
SO Journal of the American Ceramic Society (1999), 82(6), 1463-1466
CODEN: JACTAW; ISSN: 0002-7820
PB American Ceramic Society
DT Journal
LA English
CC 57-2 (Ceramics)
Section cross-reference(s): 75, 76
AB K(**Ta**,Nb)O3 (KTN) thin films have been prepared by the chemical solution deposition method. KTN precursors consisted of a uniform mixture of K[**Ta**(OC2H5)6] and K[Nb(OC2H5)6] with interaction at the mol. level. Perovskite KTN thin films with the desired composition (**Ta**/Nb = 65/35, 50/50, and 35/65) were synthesized from the precursor solns. by the

dip coating method. KTN thin films with (**100**) preferred
orientation were successfully synthesized on MgO(**100**) and Pt(
100)/MgO(**100**) substrates. X-ray **pole**
figure measurements showed that **grains** of KTN films had
a prominent three-dimensional regularity on MgO(**100**) and Pt(
100)/MgO(**100**) **surfaces.** The Curie temps. of
KTN films decreased with increasing **Ta**/Nb ratio. Typical P-E
hysteresis loops were observed for KTN thin films of three compns. on Pt(
100)/MgO(**100**) substrates. The values of remanent
polarization (Pr) of KTN films increased as the **Ta**/Nb ratio
changed from 65/35 to 35/65.

ST potassium niobate tantalate film chem soln deposition property; crystal
structure potassium niobate tantalate film chem soln deposition; dielec
property potassium niobate tantalate film chem soln deposition

IT **Crystal orientation**
Crystal **structure**
Curie temperature (ferroelectric)
Dielectric constant
Dielectric polarization
(chemical solution deposition processing and properties of oriented K(
Ta,Nb)O3 films)

IT Coating process
(chemical solution; chemical solution deposition processing and properties
of
oriented K(**Ta**,Nb)O3 films)

IT 55200-32-3P, Potassium niobium **tantalum** oxide KNb0.5Ta0.5O3
108504-90-1P, Potassium niobium **tantalum** oxide KNb0.35Ta0.65O3
126282-59-5P, Niobium potassium **tantalum** oxide (Nb0.65KTa0.35O3)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN
(Synthetic preparation); TEM (Technical or engineered material use); PREP
(Preparation); PROC (Process); USES (Uses)
(films; chemical solution deposition processing and properties of oriented
K(
Ta,Nb)O3 films)

IT 917-58-8, Potassium ethoxide 6074-84-6, **Tantalum** ethoxide
80638-36-4, Niobium ethoxide
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(precursor; chemical solution deposition processing and properties of
oriented K(**Ta**,Nb)O3 films)

IT 1309-48-4, Magnesium oxide (MgO), processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(substrate, single-crystal; chemical solution deposition processing and
properties of oriented K(**Ta**,Nb)O3 films)

IT 7440-06-4, Platinum, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(substrate; chemical solution deposition processing and properties of
oriented K(**Ta**,Nb)O3 films)

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L88 ANSWER 25 OF 55 CAPLUS
AN 2000:104915 CAPLUS
DN 132:211151
ED Entered STN: 15 Feb 2000
TI Cold drawing and annealing **textures** of **tantalum** wires
AU Zhang, Xinming; Zhang, Shaorui; Zhou, Zhuoping; Shu, Yongchun
CS Department of Materials Science and Engineering, Central South University of Technology, Changsha, 410083, Peop. Rep. China
SO Zhongguo Youse Jinshu Xuebao (1999), 9(4), 774-778
CODEN: ZYJXFK; ISSN: 1004-0609
PB Zhongguo Youse Jinshu Xuebao Bianjibu
DT Journal
LA Chinese
CC 56-11 (Nonferrous Metals and Alloys)
AB The cold drawing **textures** of **tantalum** wires for different redns. in area and their recrystn. **textures** at different temps. were investigated by **pole figures** and orientational **distribution functions** (ODF). It was found that the (110) fiber **texture** was mainly gathered on the α-fiber and strengthened with the reduction in area; the **texture** components consisted of {441}<110>, {332}<110>, {334}<110> and {115}<110>, and the component {441}<110> was the strongest. The <110> fiber **texture** can be explained by the {110}.ltbbrac.**111**.rtbbrac. dislocation-slip. The corresponding simulation carried by using a full constraints Taylor model showed a good result compared with the exptl. one. There were two types of the annealing **textures** in two sizes of wires, the annealing of the drawn wires with 77% area reduction at different temps. basically generated the same **textures** as their drawn wires had, the **texture** can be mainly attributed to continuous recrystn.

The same results were found in the annealed wires with 90% area reduction at low temperature However, in the annealed wires at high temps., the new **texture** {**111**}<110>-{**111**
}<112> was found, the formation of new components can be elucidated in terms of discontinuous recrystn. and the oriented growth.

ST **tantalum** wire drawing recrystn **texture**

IT Annealing
Orientational **distribution function**
Texture (metallographic)
Wire drawing
(cold drawing and annealing **textures** of **tantalum** wires)

IT **7440-25-7**, **Tantalum**, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(cold drawing and annealing **textures** of **tantalum** wires)

L88 ANSWER 26 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 3

AN 1999:808125 CAPLUS

DN 132:116390

ED Entered STN: 23 Dec 1999

TI Effect of ultra-thin Cu underlayer on the magnetic properties of Ni80Fe20/Fe50Mn50 films

AU Liu, C.; Shen, L.; Jiang, H.; Yang, D.; Wu, G.; Alexander, C.; Mankey, G. J.

CS Center for Materials for Information Technology, University of Alabama, Tuscaloosa, AL, 35487-0209, USA

SO Materials Research Society Symposium Proceedings (1999), 562(Polycrystalline Metal and Magnetic Thin Films), 69-74
CODEN: MRSPDH; ISSN: 0272-9172

PB Materials Research Society

DT Journal

LA English

CC 77-1 (Magnetic Phenomena)

AB The Ni80Fe20/Fe50Mn50 thin film system exhibits exchange bias behavior. Here a systematic study of the effect of atomic-scale thin film **roughness** on coercivity and exchange bias is presented. Cu (t) / **Ta** (**100** Å) / Ni80Fe20 (**100** Å) / Fe50Mn50 (200 Å) / **Ta** (200 Å) with variable thickness, t, of the Cu underlayer were d.c. sputtered on Si (**100**) substrates. The Cu underlayer defines the initial **roughness** that is transferred to the film material since the film grows conformal to the initial morphol. Atomic Force Microscopy and x-ray diffraction were used to study the morphol. and **texture** of the films. Morphol. characterization is then correlated with magnetometer measurements. Atomic Force Microscopy shows that the root mean square value of the film **roughness** exhibits a maximum of 2.5 Å at t = 2.4 Å. X-ray diffraction spectra show the films are polycryst. with face centered cubic (111
) **texture** and the Fe50Mn50 (**111**) **peak intensity** decreases monotonically with increasing Cu thickness, t. Without a Cu underlayer, the values of the coercivity and loop shift are,

Hc = 12 Oe and Hp = 56 Oe, resp. Both the coercivity and loop shift change with Cu underlayer thickness. The coercivity reaches a maximum value of Hc = 36 Oe at t = 4 Å. The loop shift exhibits an initial increase with t, reaches a maximum value of Hp = 107 Oe at t = 2.4 Å, followed by a decrease with greater Cu thickness. A tiny increase in the film **roughness** has a huge effect on the exchange bias magnitude.

ST ultrathin copper underlayer effect magnetic property nickel iron film; manganese iron film ultrathin copper underlayer effect magnetic property; roughness film magnetic coercivity morphol nickel iron manganese film

IT Crystal morphology
Texture (metallographic)
(atomic force microscopy and x-ray diffraction; effect of ultra-thin Cu underlayer on magnetic properties of Ni80Fe20/Fe50Mn50 films)

IT Coercive force (magnetic)
Crystal growth
Magnetic properties
Magnetometers
Sputtering
Surface roughness
(effect of ultra-thin Cu underlayer on magnetic properties of Ni80Fe20/Fe50Mn50 films)

IT Crystal structure types
(x-ray diffraction; effect of ultra-thin Cu underlayer on magnetic properties of Ni80Fe20/Fe50Mn50 films)

IT **7440-25-7**, **Tantalum**, properties 7440-50-8, Copper, properties 11148-13-3, Iron 20, nickel 80 (atomic) 51403-40-8, Iron 50, manganese 50 (atomic)
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(effect of ultra-thin Cu underlayer on magnetic properties of Ni80Fe20/Fe50Mn50 films)

IT 7440-21-3, Silicon, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(substrate; effect of ultra-thin Cu underlayer on magnetic properties of Ni80Fe20/Fe50Mn50 films)

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L88 ANSWER 27 OF 55 CAPLUS
AN 1999:809722 CAPLUS
DN 132:56023
ED Entered STN: 24 Dec 1999
TI Pyrochlore-type phases for actinides and rare earth elements immobilization

Page 46Oltmans10014310

AU Stefanovsky, S. V.; Yudintsev, S. V.; Nikonov, B. S.; Omelianenko, B. I.; Gorshkov, A. I.; Sivtsov, A. V.; Lapina, M. I.; Ewing, R. C.
CS SIA "Radon", Moscow, 119121, Russia
SO Materials Research Society Symposium Proceedings (1999), 556(Scientific Basis for Nuclear Waste Management XXII), 27-34
CODEN: MRSPDH; ISSN: 0272-9172
PB Materials Research Society
DT Journal
LA English
CC 71-11 (Nuclear Technology)
Section cross-reference(s): 57
AB Pyrochlore is a complex oxide with the nominal formula A2B2X6Y, where A and B are cations in VIII and VI-fold coordination, X and Y are anions. Its **structure** is derived from the cubic fluorite **structure.** In natural pyrochlores A = Na, Mg, K, Ca, Mn, Fe, Sr, Sb, Cs, Ba, REEs, Pb, Bi, Th, and U; B = Nb, **Ta**, Ti, Zr, Sn, W, Fe, and Al; X = O; Y = O, OH, or F. Synthetic pyrochlores have been repeatedly described as matrixes designed for actinide-bearing waste immobilization. In synthetic pyrochlores site A is mainly occupied by Ca, U, An, and REEs; B = Ti and Zr; X and Y = O. The authors have studied pyrochlores in crystalline titanate-based waste forms. The ceramics were fabricated in the system: Ca-Mn-U-REE-Zr-Ti-Al-O by cold pressing and sintering, melting in a high-temperature furnace, and inductive melting in a cold crucible. All specimens were studied by XRD, SEM/EDS and TEM methods. The amount of pyrochlore in the samples varied from 10 to 70%. Other phases in these ceramics were brannerite, perovskite, zirconolite, murataite, hibonite, loverengite, pseudobrookite, and rutile. Compns. of the pyrochlores correspond to stoichiometry: A2B2O7-x, 0.1<x<0.4, where A = Ca, Mn, REEs, U, Zr; B = Ti, Zr, Al, Mn. The positions and **intensities** of the **peaks** of pyrochlores from various ceramics were: d222 = 2.89-2.93 A, I = **100**; d400 = 2.51, I = 10-25; d440 = 1.779-1.809, I = 20-60; d622 = 1.512-1.540, I = 20-35; d444 = 1.451-1.477, I = 10-15; d662 = 1.158-1.173, I = 10-15. These data allowed the determination of the unit-cell dimensions of the pyrochlores as 1.00-1.02 nm. Results obtained from TEM research agree well with these values. Distribution of U and REEs among all phases of the ceramics was characterized. The main substitutions which have influenced the pyrochlore compns. are discussed.
ST pyrochlore phase actinide rare earth immobilization radioactive waste
IT Ceramics
Pyrochlore-type crystals
Radioactive wastes
(pyrochlore-type phases for actinides and rare earth elements immobilization)
IT Actinide oxides
Rare earth oxides
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(pyrochlore-type phases for actinides and rare earth elements immobilization)
RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L88 ANSWER 28 OF 55 CAPLUS
AN 1999:716619 CAPLUS
DN 132:29021
ED Entered STN: 10 Nov 1999
TI Microstructure and crystallographic **texture** of reactively sputtered FeTaN films
AU Klemmer, T. J.; Inturi, V.; Minor, K.; Barnard, J.; Thomas, J.; Blachere, J.
CS Center for Materials for Information Technology, The University of Alabama, Tuscaloosa, AL, 35487, USA
SO Thin Solid Films (1999), 353(1,2), 16-19
CODEN: THSFAP; ISSN: 0040-6090
PB Elsevier Science S.A.
DT Journal
LA English
CC 75-12 (Crystallography and Liquid Crystals)
Section cross-reference(s): 77
AB X-ray **pole figure** anal. was used to measure the crystallog. **texture** of FeTaN as a function of N content. The **pole figures** were used to semi-quant. describe the **texture** using the orientation **distribution function.** The grain structure and **texture** is further analyzed with cross-sectional TEM. The preferred **crystallog. orientations** are mostly randomly **oriented**, except for fiber **textures** that range from a (**111**) for FeTa to a weak (110) for FeTaN. The effect of a Ti underlayer is also described

which greatly enhances the (110) fiber **texture** in all of the films studied.

ST iron **tantalum** nitride film crystallog **texture** **microstructure**; orientation **distribution** **function** iron **tantalum** nitride film

IT Orientational **distribution** **function**
(of reactively sputtered iron **tantalum** nitride films)

IT **Crystal orientation**
Microstructure
(of reactively sputtered iron **tantalum** nitride films as function of nitrogen content)

IT 145077-50-5, Iron **tantalum** nitride
RL: PRP (Properties)
(**microstructure** and crystallog. **texture** of reactively sputtered iron **tantalum** nitride films as function of nitrogen content)

IT 7440-32-6, Titanium, uses
RL: NUU (Other use, unclassified); USES (Uses)
(**microstructure** and crystallog. **texture** of reactively sputtered iron **tantalum** nitride films with underlayer of)

RE.CNT 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L88 ANSWER 29 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN

AN 1998:662954 CAPLUS

DN 129:279333

ED Entered STN: 21 Oct 1998

TI **Textures** of thin copper films

AU Kuschke, W-M.; Kretschmann, A.; Keller, R-M.; Vinci, R. P.; Kaufmann, C.; Arzt, E.

CS Max-Planck-Institut fur Metallforschung and Institut fur Metallkunde, Universitat Stuttgart, Stuttgart, 70174, Germany

SO Journal of Materials Research (1998), 13(10), 2962-2968

CODEN: JMREEE; ISSN: 0884-2914
PB Materials Research Society
DT Journal
LA English
CC 56-6 (Nonferrous Metals and Alloys)

AB The **textures** of thin copper films were determined quant. by measuring **(111) pole figures** with x-ray diffraction.
Measurements were performed on a variety of samples, differing in copper film thickness and deposition technique, diffusion barrier material, and the presence or absence of a cap layer. **Texture** changes due to an annealing treatment were also recorded and correlated with stress measurements by the wafer-curvature technique. The deposition method (PVD vs CVD) has a strong effect on **texture**, barrier layer effects range from negligible to significant depending on the barrier material, and the effect of a cap layer is insignificant.

ST copper film PVD CVD **texture**

IT Vapor deposition process
(chemical; **textures** of thin copper films)

IT Sputtering
(**textures** of thin copper films)

IT **Texture** (metallographic)
(thin copper films)

IT **7440-25-7, Tantalum**, uses 7440-33-7, Tungsten, uses
12033-89-5, Silicon nitride, uses 25583-20-4, Titanium nitride tin
RL: TEM (Technical or engineered material use); USES (Uses)
(diffusion barrier; **textures** of thin copper films)

IT 7440-50-8, Copper, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**textures** of thin copper films)

RE.CNT 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR THIS RECORD

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Symp Proc 309 1993, P269 CAPLUS
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L88 ANSWER 30 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1998:750666 CAPLUS
DN 130:59502
ED Entered STN: 27 Nov 1998
TI Microstructure and **texture** of electroplated copper in damascene structures
AU Gross, M. E.; Lingk, C.; Siegrist, T.; Coleman, E.; Brown, W. L.; Ueno, K.; Tsuchiya, Y.; Itoh, N.; Ritzdorf, T.; Turner, J.; Gibbons, K.; Klawuhn, E.; Biberger, M.; Lai, W. Y. C.; Miner, J. F.; Wu, G.; Zhang, F.
CS Bell Labs, Lucent Technologies, Murray Hill, NJ, 07974, USA
SO Materials Research Society Symposium Proceedings (1998), 514(Advanced Interconnects and Contact Materials and Processes for Future Integrated Circuits), 293-298
CODEN: MRSPDH; ISSN: 0272-9172
PB Materials Research Society
DT Journal
LA English
CC 76-2 (Electric Phenomena)
AB The transition from Al to Cu for advanced ULSI interconnects involves changes in architecture and deposition technique that will influence the **microstructure** and **texture** of the metal. Cu interconnects are typically formed within the confines of pre-patterned trenches and vias using an electroplating process with a sputtered Cu conduction layer deposited over a refractory metal-based diffusion barrier layer. The authors focus on the influence of the barrier layer (PVD Ti/TiN, **Ta**, TaN, CVD TiN) and the effect of a vacuum break between barrier and conduction layer depositions, on the **texture** of the Cu lines, as examined by x-ray diffraction **pole figure** anal. A preferred **(111)** orientation was observed for all samples. The samples with no vacuum break between barrier and conduction layer deposition exhibited in plane anisotropy that was particularly pronounced for the **Ta** and TaN samples compared with the Ti/TiN sample. Focused ion beam images and transmission electron micrographs showed Cu **grain** size to be on the order of the trench width with a high degree of twinning, and no boundary could be distinguished between the PVD Cu conduction layer and the electroplated Cu.
ST ULSI aluminum copper interconnection damascene structure
IT Integrated circuits
(ULSI; microstructure and **texture** of electroplated aluminum and copper interconnections in ULSI in damascene structures)
IT Vapor deposition process

(chemical; microstructure and **texture** of electroplated aluminum and copper interconnections in ULSI in damascene structures)

IT Electrodeposition
Interconnections (electric)
Sputtering
X-ray diffraction
(microstructure and **texture** of electroplated aluminum and copper interconnections in ULSI in damascene structures)

IT Diffusion barrier
Electronic device fabrication
Scanning electron microscopy
(**microstructure** and **texture** of electroplated copper in damascene **structures** with titanium and **tantalum** nitride barriers)

IT 7429-90-5, Aluminum, uses 7440-50-8, Copper, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(microstructure and **texture** of electroplated aluminum and copper interconnections in ULSI in damascene structures)

IT **7440-25-7**, **Tantalum**, uses 7440-32-6, Titanium, uses 12033-62-4, **Tantalum** nitride (TaN) 25583-20-4, Titanium nitride (TiN)
RL: TEM (Technical or engineered material use); USES (Uses)
(**microstructure** and **texture** of electroplated copper in damascene **structures** with titanium and **tantalum** nitride barriers)

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L88 ANSWER 31 OF 55 CAPLUS
AN 1998:727142 CAPLUS
DN 130:73124
ED Entered STN: 17 Nov 1998
TI Raman characterization of amorphous and nanocrystalline sp3 bonded structures
AU Prawer, S.; Nugent, K. W.
CS School of Physics, University of Melbourne, Parkville, 3052, Australia
SO Amorphous Carbon: State of the Art, Proceedings of the International Specialist Meeting on Amorphous Carbon, 1st, Cambridge, UK, July 31-Aug. 1, 1997 (1998), Meeting Date 1997, 199-214. Editor(s): Silva, S. R. P. Publisher: World Scientific, Singapore, Singapore.
CODEN: 66YFAF

DT Conference
LA English
CC 73-3 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
AB The authors propose methods by which Raman spectroscopy can be used to characterize tetrahedral amorphous C (**ta**-C) films. For Raman spectra measured using 488 or 514 nm laser irradiation, the skewness of the peak decreases with increasing sp3 fraction. For spectra measured using 244 nm irradiation, peaks appear at 1100 and 1600-1650 cm-1. The ratio of the **intensities** of these **peaks**, I(1100)/I(1650) and the position of the 1600-1650" peak both increase as a function of sp3 content. While these methods are not fully quant., they do provide a rapid, nondestructive method for the identification of **ta**-C films with high sp3 content. By comparing of the Raman spectra from amorphized diamond, nanocryst. diamond and **ta**-C with each other and with the calculated vibrational d. of states of diamond, the authors are able to tentatively assign broad peaks at 400-500 cm-1 and at .apprx.1250 cm-1 to those arising from amorphous sp3 bonded C. A sharp peak at 1100 cm-1 is assigned to a **surface** phonon of diamond and the relatively sharp feature at 1630-1650 cm-1 is assigned to localized < **100**> interstitial defects. Probably the spectrum obtained from the amorphized diamond provides the characteristic Raman spectrum which would be expected from a **ta**-C with no graphite-like amorphous sp2 components.
ST Raman amorphous nanocryst carbon electron hybridization; diamond vibrational state density surface phonon
IT Electron hybridization
Interstitials
Raman spectra
Surface phonon
(Raman characterization of amorphous and nanocryst. sp3 bonded structures)
IT Density of states
(vibrational; Raman characterization of amorphous and nanocryst. sp3 bonded structures)
IT 7782-40-3, Diamond, properties
RL: PRP (Properties)
(amorphized; Raman characterization of amorphous and nanocryst. sp3 bonded structures)
IT 7440-44-0, Carbon, properties
RL: PRP (Properties)
(amorphous; Raman characterization of amorphous and nanocryst. sp3 bonded structures)
RE.CNT 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
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L88 ANSWER 32 OF 55 JICST-EPlus COPYRIGHT 2004 JST on STN
AN 980796292 JICST-EPlus
TI Effect of Pt Electrode Orientation on SrBi2Ta2O9 Thin Films Prepared by Sol-Gel Method.
AU KOIWA I; KATO H; KANEHARA T
HASHIMOTO A; SAWADA Y
ICHINOSE N; OSAKA T
CS Oki Electric Ind. Co. Ltd., Tokyo, Jpn
Tokyo Ohka Kogyo Co. Ltd., Kanagawa, Jpn
Waseda Univ., Tokyo, Jpn
SO Denshi Joho Tsushin Gakkai Gijutsu Kenkyu Hokoku (IEIC Technical Report (Institute of Electronics, Information and Communication Enginners)), (1998) vol. 98, no. 196(ICD98 91-112), pp. 55-60. Journal Code: S0532B (Fig. 9, Ref. 9)
CY Japan
DT Journal; Article
LA English
STA New
AB SrBi2Ta2O9(SBT) thin films are drawing attention as fatigue-free materials. We have prepared SBT films using our original sol-gel method and studied effects of Pt electrode **crystal**-orientation on SBT properties. **Peak intensities** of the Pt(**111**) plane were increased by annealing at 750.DEG.C. for 30min in an O2 atmosphere and those of Pt(200) plane decreased. Orientation changes of Pt electrode by annealing were different for the types of Pt electrode. Effects of Pt electrode orientation on SBT film properties are very weak, scarcely affecting either **structure** or electrical properties. Formation of SBT films on Pt electrodes suppressed the orientation change of Pt electrodes by annealing. (author abst.)
CC NC03020K (621.315.5)
CT platinum electrode; orientation(direction); sol-gel process; ferroelectrics; dielectric thin film; strontium compound; bismuth compound; **tantalum** compound; oxide; heat treatment; polarization

reversal
BT electrode; dielectrics; dielectric material; material; thin film; membrane and film; alkaline earth metal compound; nitrogen group element compound; 5A group element compound; transition metal compound; chalcogenide; oxygen group element compound; oxygen compound; treatment; electrical property; reversal

L88 ANSWER 33 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1998:701361 CAPLUS
ED Entered STN: 05 Nov 1998
TI Microstructures and properties of high saturation soft magnetic materials for advanced recording heads
AU Wang, S. X.; Hong, J.; Sin, K.
CS Dept. of Materials Science and Engineering, Stanford University, CA, 94305-2205, USA
SO Materials Research Society Symposium Proceedings (1998), 517(High-Density Magnetic Recording and Integrated Magneto-Optics: Materials and Devices), 5
CODEN: MRSPDH; ISSN: 0272-9172
PB Materials Research Society
DT Journal
LA English
AB This paper presents recent development on **sputtered** FeXN-based (X=**Ta**, Rh, Mo, Al, etc.) high saturation materials [1,2] and compare them with amorphous CoZr-based materials and electroplated NiFe- and CoFe-based materials [3,4] in the context of advanced high d. magnetic recording. In particular, correlations among processing, microstructure and magnetic properties under oblique incidence and in laminated structures are discussed. Due to the extrinsic nature of coercivity, the mechanisms of soft magnetism are very complex and difficult to characterize. With the help of synchrotron radiation, pole figure anal., transmission electron microscopy (TEM), torque magnetometry, and magnetic force microscopy (MFM), we can identify that (110) fiber **texture** plays a key role in the soft magnetism of FeXN films, in addition to the effects of film composition, stress, grain size and shape, and lattice spacing [5]. Soft films, both single and laminated, usually display well defined bcc (110) **textures** even on sloping surfaces. In contrast, films with poor (110) **textures** and asym. pole figures tend to have relatively large coercivities, and in certain cases possess perpendicular anisotropy and **stripe** domains. Processing conditions promoting (110) **texture**, including substrate bias, lamination with AIN, and appropriate base layer, lead to soft magnetism in FeXN films [6]. The addition of N and a third element, and lamination with insulating layers, result in significant increases in elec. resistivity, important to high frequency applications. The addition of N and X can also lead to enhanced pitting corrosion resistance [7].
RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
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(2) Hong, J; IEEE Trans Magn, in press 1998, V34
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(4) Ohashi, K; Paper DQ-09, the 7th Joint MMM-Intermag Conference 1998

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(7) Wang, S; To be published

L88 ANSWER 34 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1995:841473 CAPLUS
DN 123:294207
ED Entered STN: 07 Oct 1995
TI Synthesis of highly oriented K(**Ta**,Nb)O3 (**Ta**:Nb = 65:35) film using metal alkoxides
AU Yogo, Toshinobu; Kikuta, Koichi; Ito, Yasuhiro; Hirano, Shin-ichi
CS Dep. Appl. Chem., Nagoya Univ., Nagoya, 464-01, Japan
SO Journal of the American Ceramic Society (1995), 78(8), 2175-9
CODEN: JACTAW; ISSN: 0002-7820
PB American Ceramic Society
DT Journal
LA English
CC 57-2 (Ceramics)
AB Highly oriented K(TaNb)O3 (Ba:Nb = 65:35) (KTN) thin films of perovskite **structure** were synthesized successfully on Pt(**100**)/MgO(**100**) substrates from a metal alkoxide solution through reaction control. Homogeneous KTN coating solns. prepared from KOC2H5, **Ta** (OC2H5)5, and Nb(OC2H5)5 in ethanol were analyzed by hH, 13C, and 93Nb NMR spectroscopy. The KTN precursor included a mol.-level mixture of K[M(OC2H5)6] (M = **Ta**, Nb) units interacting in ethanol solution X-ray **pole figure** measurement showed that perovskite KTN films crystallized on Pt(**100**)/MgO(**100**) substrates had not only a (**100**) orientation but also a three-dimensional regularity of **grains.** The remanent polarization coercive field of the KTN film (thickness, 1.0 μm) crystallized at 700°C were 1.5 μC/cm2 and 8.7 kV/cm, resp., at 225 K.
ST potassium niobate tantalate film synthesis alkoxide
IT Ferroelectricity
(synthesis of highly oriented K(**Ta**,Nb)O3 (**Ta**:Nb = 65:35) film using metal alkoxides and properties)
IT 108504-90-1P, Niobium potassium **tantalum** oxide (Nb0.35KTa0.65O3)
RL: SPN (Synthetic preparation); PREP (Preparation)
(films; synthesis of highly oriented K(**Ta**,Nb)O3 (**Ta**:Nb = 65:35) film using metal alkoxides)

L88 ANSWER 35 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 4
AN 1996:112187 CAPLUS
DN 124:189822
ED Entered STN: 22 Feb 1996
TI Growth of oxide crystals thin films through sol-gel method. KTN epitaxy film
AU Hirano, Shin-ichi; Yogo, Toshinobu
CS Sch. Eng., Nagoya Univ., Nagoya, 464-01, Japan
SO Nippon Kessho Seicho Gakkaishi (1995), 22(5), 388-94
CODEN: NKSGDK; ISSN: 0385-6275
PB Nippon Kessho Seicho Gakkai
DT Journal

LA Japanese
CC 75-1 (Crystallography and Liquid Crystals)
AB The sol-gel method is one of the promising methods to synthesize the well-defined films. In this article, the key processing parameters are introduced to prepare the epitaxial oxide film of K(**Ta**, Nb)O3. Epitaxial potassium tantalate-niobate (KTaxNb1-xO3, KTN) thin films could be synthesized through reaction control of a metal alkoxide solution The **structure** of KTN precursors in solution was analyzed by NMR spectroscopy. The KTN precursor consists of K[Nb(OEt)6] and K[**Ta** (OEt)6] with a mol. level interaction in ethanol. Starting metal alkoxides including metal-oxygen-carbon bonds were found to undergo bond rearrangement, yielding KTN precursors under the controlled reaction conditions. Perovskite KTN films crystallized on MgO(**100**) substrates using H2O/O2 vapor treatment at 300° followed by crystallization at 675°. KTN films on Pt(**100**)/MgO(**100**) of perovskite phase also crystallized at 700°. KTN films were confirmed to grow epitaxially on Pt(**100**)/MgO(**100**) substrates by x-ray **pole figure** anal. KTa0.65Nb0.35O3 films grown on Pt(**100**)/MgO(**100**) substrates showed P-E hysteresis at 225 K. The Curie temperature of the KTa0.65Nb0.35O3 film was 310 K.
ST epitaxy niobium potassium **tantalum** oxide
IT Epitaxy
(sol-gel; K(**Ta**, Nb)O3 films grown using Nb(OEt)5, **Ta** (OEt)5, KOEt, and H2O/O2 vapor)
IT 917-58-8, Potassium ethoxide 3236-82-6, Niobium ethoxide (Nb(OEt)5) 6074-84-6 108504-90-1, Niobium potassium **tantalum** oxide (Nb0.35KTa0.65O3)
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(epitaxial K(**Ta**, Nb)O3 films grown by sol-gel method using Nb(OEt)5, **Ta**(OEt)5, KOEt, and H2O/O2 vapor)

L88 ANSWER 36 OF 55 CAPLUS
AN 1995:460489 CAPLUS
DN 123:99624
ED Entered STN: 01 Apr 1995
TI Effect of RTA on leakage current of Ta2O5 thin films deposited by PECVD
AU Kim, Gin Beum; Lee, Seoung Ho; So, Myoung Gi
CS Department Materials Engineering, Kang Won National University, S. Korea
SO Han'guk Chaelyo Hakhoechi (1994), 4(5), 550-5
CODEN: HCHAEU; ISSN: 1225-0562
DT Journal
LA Romanian
CC 76-9 (Electric Phenomena)
Section cross-reference(s): 75
AB The effects of RTA treatment on the leakage current were studied for Ta2O5 films deposited by PECVD on P-type(**100**) Si substrate using TaCl5 (99.99%) and N2O (99.99%) gaseous mixture The refractive index increased with increasing the deposition temperature and the maximum deposition rate was obtained at 500°. The **Ta**-O bond **peak intensity** of as-deposited Ta2O5 increased with increasing the deposition temperature through FTIR anal. and the leakage current value was decreased with increasing the deposition temperature The small leakage current

value obtained after RTA treatment of as-deposited Ta2O5 is due to the
reduction of O-deficient **structure** in the film. The increases of
the O concentration and the **Ta**-O bond **peak intensity**
in the film after RTA treatment were measured by AES and FTIR analyses.

ST RTA leakage current **tantalum** oxide PECVD

IT Annealing
Electric insulators and Dielectrics
(effect of RTA on leakage current of **tantalum** pentoxide thin films deposited by plasma enhanced CVD)

IT Electric current
(leakage, effect of RTA on leakage current of **tantalum** pentoxide thin films deposited by plasma enhanced CVD)

IT Bond
(oxygen-**tantalum**, effect of RTA on leakage current of **tantalum** pentoxide thin films deposited by plasma enhanced CVD)

IT Vapor deposition processes
(plasma, effect of RTA on leakage current of **tantalum** pentoxide thin films deposited by plasma enhanced CVD)

IT Oxidation
(thermal, effect of RTA on leakage current of **tantalum** pentoxide thin films deposited by plasma enhanced CVD)

IT 1314-61-0P, **Tantalum** oxide (Ta2O5)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses)
(effect of RTA on leakage current of **tantalum** pentoxide thin films deposited by plasma enhanced CVD)

IT 7721-01-9, **Tantalum** chloride (TaCl5) 10024-97-2, Nitrogen oxide (N2O), processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(effect of RTA on leakage current of **tantalum** pentoxide thin films deposited by plasma enhanced CVD)

IT 7440-21-3, Silicon, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(substrate; effect of RTA on leakage current of **tantalum** pentoxide thin films deposited by plasma enhanced CVD)

L88 ANSWER 37 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN

AN 1994:539190 CAPLUS

DN 121:139190

ED Entered STN: 17 Sep 1994

TI **Texture** and **microstructure** of rolled and annealed **tantalum**

AU Raabe, D.; Schlenkert, G.; Weisshaupt, H.; Lucke, K.

CS Inst. Metallkunde and Metallphysik, RWTH, Aachen, Germany

SO Materials Science and Technology (1994), 10(4), 299-305
CODEN: MSCTEP; ISSN: 0267-0836

DT Journal

LA English

CC 56-8 (Nonferrous Metals and Alloys)

AB Pure **Ta** has been cold rolled and annealed at various temps. The crystallog. **textures** were studied by measuring x-ray **pole figures** and subsequently calculating the orientation **distribution function.** The **microstructure** was investigated via optical microscopy. The rolling **textures** were explained by dislocation glide on {110} <**111**>, {112} <**111**>, and {123} <**111**> glide systems. Corresponding simulations were carried out using relaxed constraints Taylor theory. Interpretation of the annealing **textures** was carried out via continuous recrystn. in the case of weak deformations and temps. and via discontinuous recrystn. for higher rolling degrees and temps. resp.

ST **tantalum** rolling annealing **texture** **microstructure**

IT Recrystallization
(continuous or discontinuous, of rolled and annealed **tantalum**, deformation degree and temperature effect on, **texture** in relation to)

IT **Texture**, metallographic
(of rolled and annealed **tantalum**, resp. dislocation glide and recrystn. in relation to)

IT Annealing
(of rolled **tantalum**, **texture** from, recrystn. in relation to)

IT Metalworking
(rolling, of **tantalum**, **texture** from, dislocation glide in relation to)

IT **7440-25-7**, **Tantalum**, properties
RL: PRP (Properties)
(**texture** and **microstructure** of rolled and annealed)

L88 ANSWER 38 OF 55 COMPENDEX COPYRIGHT 2004 EEI on STN
AN 1995(17):4453 COMPENDEX
TI Magnetic properties of two-phase nanocrystalline alloy determined by anisotropy and exchange interactions through amorphous matrix.
AU Kulik, T. (UC-RENFE, Madrid, Spain); Hernando, A.
SO Journal of Magnetism and Magnetic Materials v 138 n 3 Dec 1994.p 270-280
CODEN: JMMMDC ISSN: 0304-8853
PY 1994
DT Journal
TC Experimental
LA English
AB Amorphous Fe73.5Cu1Ta3Si13.5B9 alloy was transformed, during annealing for 1 h at **Ta** equals 480-580 degree C, to nanocrystalline material composed of an amorphous matrix and alpha -Fe(Si) **crystallites** with bcc **structure** and diameters of approximately 15 nm.The temperature dependence of the magnetic properties of the nanocrystalline samples with different volume fractions of **crystallites** was studied.The coercive field and saturation magnetization were determined from quasi-static hysteresis loops measured from room temperature up to 580 degree C using a computerized hysteresis loop tracer.A peak of the coercive field Hc was found for all the samples studied.The **peak** temperature and **intensity** depend strongly on the material

microstructure.Reduction of exchange interactions between
crystallites is responsible for the observed increase in Hc at
temperatures around the Curie point of the amorphous matrix.The
superparamagnetic behavior of the **crystallites** and the decrease
in their magnetocrystalline anisotropy are the origins of the decrease in
Hc at high temperatures.(Author abstract) **17** Refs.

CC 708.4 Magnetic Materials; 545.2 Iron Alloys; 933.1.1 Crystal Lattice;
701.2 Magnetism: Basic Concepts and Phenomena; 931.2 Physical Properties
of Gases, Liquids and Solids; 933.2 Amorphous Solids

CT *Ferromagnetic materials; Magnetic field effects; Magnetization; Coercive
force; Magnetic hysteresis; **Crystal** microstructure;
Paramagnetism; Magnetic anisotropy; Iron alloys; Nanostructured materials

ST Two phase nanocrystalline alloys; Exchange interactions; Iron copper
tantalum silicon boron alloy; Curie point; Superparamagnetism

ET B*Cu*Fe*Si*Ta; B sy 5; sy 5; Cu sy 5; Fe sy 5; Si sy 5; Ta sy 5;
Fe73.5Cu1Ta3Si13.5B9; Fe cp; cp; Cu cp; Ta cp; Si cp; B cp; C; Fe*Si; Fe
sy 2; sy 2; Si sy 2; Fe(Si)

L88 ANSWER 39 OF 55 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 1993-020425 [03] WPIX
CR 1995-202429 [27]
DNN N1993-015672 DNC C1993-009176
TI Sliding members having increased surface hardness - are obtd. by
electroplating metal of controlled **crystal structure.**
DC M11 M26 Q52 Q62 Q65
IN FUJISAWA, Y; GUNJI, T; NARISHIGE, T; OKAMOTO, K; TSUJI, M
PA (HOND) HONDA GIKEN KOGYO KK; (HOND) HONDA MOTOR CO LTD
CYC 6

PI	GB 2257759	A	19930120	(199303)*	63p	F16C033-12
	DE 4223631	A1	19930128	(199305)	41p	F16C033-06
	JP 05025688	A	19930202	(199312)	6p	C25D007-00
	JP 05025689	A	19930202	(199312)	7p	C25D007-00
	CA 2074114	A	19930119	(199314)		F16J009-12
	FR 2685012	A1	19930618	(199337)	61p	C23C030-00
	US 5340660	A	19940823	(199433)	39p	C23F003-00
	JP 06256987	A	19940913	(199441)	6p	C25D003-20
	US 5443919	A	19950822	(199539)	24p	F16C033-12
	US 5443920	A	19950822	(199539)	24p	F16C033-12
	GB 2257759	B	19951220	(199603)		F16C033-12
	JP 2571985	B2	19970116	(199707)	5p	C25D003-20
	JP 2704801	B2	19980126	(199809)	6p	C25D007-00
	JP 2741438	B2	19980415	(199820)	6p	C25D007-04
	DE 4223631	C2	19980430	(199821)	24p	F16C033-06
	CA 2074114	C	19990119	(199914)		F16J009-12

ADT GB 2257759 A GB 1992-15382 19920720; DE 4223631 A1 DE 1992-4223631
19920717; JP 05025688 A JP 1991-202193 19910718; JP 05025689 A JP
1991-202194 19910718; CA 2074114 A CA 1992-2074114 19920717; FR 2685012 A1
FR 1992-8831 19920717; US 5340660 A US 1992-917164 19920720; JP 06256987 A
JP 1991-202197 19910718; US 5443919 A Div ex US 1992-917164 19920720, US
1994-205030 19940302; US 5443920 A Div ex US 1992-917164 19920720, US
1994-205051 19940302; GB 2257759 B GB 1992-15382 19920720; JP 2571985 B2
JP 1991-202197 19910718; JP 2704801 B2 JP 1991-202194 19910718; JP 2741438

B2 JP 1991-202193 19910718; DE 4223631 C2 DE 1992-4223631 19920717; CA 2074114 C CA 1992-2074114 19920717
FDT US 5443919 A Div ex US 5340660; US 5443920 A Div ex US 5340660; JP 2571985 B2 Previous Publ. JP 06256987; JP 2704801 B2 Previous Publ. JP 05025689; JP 2741438 B2 Previous Publ. JP 05025688
PRAI JP 1991-202197 19910718; JP 1991-202193 19910718; JP 1991-202194 19910718
IC ICM C23C030-00; C23F003-00; C25D003-20; C25D007-00; C25D007-04; F16C033-06; F16C033-12; F16J009-12
ICS B32B007-02; B32B015-04; B32B015-20; C22C038-18; C25D003-56; C25D005-26; C25D007-10; C30B029-52; F16C033-10; F16J001-01; F16J001-02; F16J009-00; G01N023-20
ICA C25D003-00; F02F003-10
AB GB 2257759 A UPAB: 19951019
The **surface** of a sliding member is formed of metal having a cubic **structure**, a part of the **surface**, especially at least 30% of the area being formed by **crystal** planes of high atomic density. The **surface** may have a body-centred cubic **structure** with a secondary slip plane forming at least 50% of the area.

The **surface** layer may be of a lead alloy with (h00) planes and opt. (**111**) and (222), planes forming the **surface**, the relative amts. determd. by X-ray diffractometry, being at least 60% as t given by the expression I(a)/(I(a)+(I)(b), where I(a) and I(b) are the integrated **intensities** for diffraction **peaks** corresp. to (h00) and (**111**) plus (222) planes respectively. The inclination of the close-packed planes relative to the sliding **surface** should be in the range 0-20 deg. and that of the sec. slip planes 0-30 deg. The sliding member may have a face-centred **structure** of Pb, Ni, Cu, Al, Ag or Au, or a body-centred **structure** of Fe, Cr, Mo, W, **Ta**, Zr, Nb or V.

USE/ADVANTAGE - Pistons of internal combustion engines; belt grooves of pulleys; rocker arms; cam shafts; inlet or exhaust valves; crankshaft journals; connecting rods. The partic. **crystalline structure** of the **surface** layer gives improved hardness and wear resistance.
3A/33
Dwg.3A/33
FS CPI GMPI
FA AB; GI

L88 ANSWER 40 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1993:413314 CAPLUS
DN 119:13314
ED Entered STN: 10 Jul 1993
TI **Pole figure** and orientation **distribution function** analyses of face centered cubic and body centered cubic metals
AU Feng, Charles; Witt, Fred
CS Armament Res. Dev. and Eng. Cent., Picatinny, NJ, 07806-5000, USA
SO Advances in X-Ray Analysis (1992), 35A, 293-302
CODEN: AXRAAA; ISSN: 0376-0308
DT Journal

LA English
CC 56-8 (Nonferrous Metals and Alloys)
AB The **textures** in fcc copper and bcc **tantalum** produced under different processes including conventional rolling and high strain rate forming by shear spinning, cold forging, high energy rate deformation were determined The effect of strain rate on **texture** development was examined The high strain rate processes may promote development of the brass **texture** in copper and a sharp **texture** with the **surface** at (111) orientation in **tantalum.** The fiber axis in **tantalum** is determined by stereog. anal. or by orientation **distribution function** calcn. with similar results.
ST **texture** upper plastic deformation effect; **tantalum** **texture** plastic deformation effect
IT **Texture**, metallographic
(of copper and **tantalum**, effect of plastic deformation method on)
IT **7440-25-7**, **Tantalum**, properties 7440-50-8, Copper, properties
RL: PRP (Properties)
(**texture** of, effect of plastic deformation method on)

L88 ANSWER 41 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1990:223951 CAPLUS
DN 112:223951
ED Entered STN: 09 Jun 1990
TI Helium-atom scattering study of the temperature-dependent charge-density-wave **surface structure** and lattice dynamics of 2H-**tantalum** diselenide (001)
AU Brusdeylins, G.; Heimlich, C.; Skofronick, J. G.; Toennies, J. P.; Vollmer, R.; Benedek, G.; Miglio, L.
CS Max-Planck-Inst. Stroemungsforsch., Goettingen, D-3400, Germany
SO Physical Review B: Condensed Matter and Materials Physics (1990), 41(9), 5707-16
CODEN: PRBMDO; ISSN: 0163-1829
DT Journal
LA English
CC 66-3 (Surface Chemistry and Colloids)
Section cross-reference(s): 65, 73, 75, 76
AB Elastic and inelastic He-atom scattering was used to measure the surface structure and surface dynamics of the layered transition-metal dichalcogenide 2H-$TaSe_2$ crystal. The results cover temps. from 60 to 140 K. Below T = 122 K, an incommensurate charge-d. wave (CDW) is formed, which becomes commensurate at $\leq$90 K. The measured **intensities** of the CDW diffraction **peaks** continuously increase with decreasing temperature <122 K. From the diffraction intensities, the temperature-dependent amplitude of the surface potential corrugation was determined The corrugation amplitude is used as an order parameter and from its temperature dependence, on cooling, a critical exponent of β = 0.33 is extracted Time-of-flight spectra were used to determine the surface-phonon dispersion curves. Although the spectra are nearly the same at 60 and 140 K, a softening in the Rayleigh mode is observed for intermediate temps.

(.apprx.**100** K) at Q = 0.53 Å -1, which is near the middle of the Brillouin zone. The difference between the bulk and the surface dynamics is interpreted through the use of the dispersive linear-chain model.
ST helium scattering **surface** lattice dynamics; **tantalum** selenide **surface structure** dynamics; incommensurate charge density wave **surface**
IT **Surface structure**
(on **tantalum** diselenide 2H-modification, helium atom scattering study of)
IT Charge-density wave
(**surface**, on **tantalum** diselenide layered compound)
IT Crystal lattice dynamics
(**surface**, on **tantalum** diselenide layered compound)
IT 7440-59-7, Helium, properties
RL: PRP (Properties)
(**surface** scattering of, on **tantalum** diselenide layered compound)
IT 12039-55-3, **Tantalum** diselenide
RL: PRP (Properties)
(**surface** scattering on, of helium atoms, lattice dynamics and **structure** in relation to)

L88 ANSWER 42 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1990:447037 CAPLUS
DN 113:47037
ED Entered STN: 03 Aug 1990
TI Characterization of rhodium films on **tantalum**(110)
AU Jiang, L. Q.; Ruckman, M. W.; Strongin, Myron
CS Phys. Dep., Brookhaven Natl. Lab., Upton, NY, 11973-6000, USA
SO Journal of Vacuum Science & Technology, A: Vacuum, Surfaces, and Films (1990), 8(3, Pt. 2), 2682-6
CODEN: JVTAD6; ISSN: 0734-2101
DT Journal
LA English
CC 66-3 (Surface Chemistry and Colloids)
Section cross-reference(s): 67, 73
AB The **surface** and electronic **structure** of Rh films on **Ta**(110) up to several monolayers thick on **Ta**(110) are characterized by photoemission, Auger emission, LEED, and low-energy ion scattering (LEIS). From the variation of the Rh Auger **peak**-to-**peak intensity** as a function of evaporation time, Rh appears to grow in the Stranski-Krastanov mode at room temperature However, the LEIS data show that the Rh adatoms begin to cluster on **Ta**(110) before growth of the monolayer is completed. Diffuse LEED scattering suggests that the Rh films are disordered. Photoemission shows that Rh chemisorption on **Ta**(110) generates 2 peaks located at -1.5 and -2.5 eV binding energy during the initial phase of thin-film growth (0 < 0 < 0.5 ML (monolayer)). By 0.75 ML Rh coverage, these states merge into a broad **structure** centered near - 2 eV binding energy. Photoemission peaks typical of a Rh(**111**) **surface** are seen at higher coverages (θ > 3.7 ML). The CO dissocs. on the Rh/

Ta(110) **surface** for Rh coverages <2.5 ML and the
surface develops a site capable of mol. CO adsorption at >0.3 ML
Rh coverage.

ST photoemission rhodium **surface** electronic **structure**;
tantalum substrate rhodium film; carbon monoxide dissocn rhodium
film

IT Energy level, **surface**
Surface structure
(of rhodium films, on **tantalum** substrate)

IT Adsorption
(of rhodium, on **tantalum**, electron spectroscopy and ion
scattering study of)

IT Dissociation catalysts
(rhodium-covered **tantalum**, for carbon monoxide)

IT 630-08-0, Carbon monoxide, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(chemisorption and dissociation of, on rhodium-covered **tantalum**)

IT **7440-25-7**, **Tantalum**, properties
RL: PRP (Properties)
(**surface** films of rhodium on, electronic and geometric
structure of)

IT 7440-16-6, Rhodium, properties
RL: PRP (Properties)
(**surface** films of, on **tantalum**, electronic and
geometric **structure** of)

L88 ANSWER 43 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1990:221482 CAPLUS
DN 112:221482
ED Entered STN: 09 Jun 1990
TI The location of **tantalum** atoms in nickel-aluminum-
tantalum alloys [Ni3(Al,**Ta**)]
AU Lin, Hui; Pope, David P.
CS Dep. Mater. Sci. Eng., Univ. Pennsylvania, Philadelphia, PA, 19104, USA
SO Journal of Materials Research (1990), 5(4), 763-8
CODEN: JMREEE; ISSN: 0884-2914
DT Journal
LA English
CC 56-8 (Nonferrous Metals and Alloys)
Section cross-reference(s): 75

AB An x-ray powder diffraction method was used to determine the location of
Ta atoms in Ni3Al. A series of Ni3(Al,**Ta**) alloys was
produced with **Ta** contents of 0.1-3.0 atomic%. Fine powders with
average particle sizes <80 μm were made from melt-spun ribbons by using a
grinding process. **Intensity** of the (**100**) superlattice
peak normalized to that of the (200) fundamental peak as a
function of **Ta** content was in agreement with the calculated values,
assuming that **Ta** atoms substitute on Al sites not on Ni sites,
and small amts. of anti-site defects exist in the ordered face centered cubic
structure. Ta atoms substitute for Al in Ni3Al. The
long-range order parameters thus calculated for the Ni3(Al,**Ta**)
alloys are generally 0.84-0.95, except for Ni75Al24.8Ta0.2 in which the

order parameter is close to unity.
ST **tantalum** atom location nickel aluminide; order **tantalum** addn nickel aluminide
IT Order
(long-range, in nickel aluminide containing **tantalum**)
IT 125373-81-1
RL: PRP (Properties)
(atomic **structure** of, location of **tantalum** atoms in)

L88 ANSWER 44 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 5
AN 1990:556964 CAPLUS
DN 113:156964
ED Entered STN: 27 Oct 1990
TI Effect of **crystallographic orientation** on mechanical properties of **tantalum** single crystals grown by electron-beam melting
AU Kaneko, Takeshi
CS Boeicho, Tokyo, Japan
SO Funtai oyobi Funmatsu Yakin (1990), 37(3), 412-20
CODEN: FOFUA2; ISSN: 0532-8799
DT Journal
LA Japanese
CC 56-12 (Nonferrous Metals and Alloys)
AB Effects of cold rolling and compression on **Ta** single crystals grown by electron-beam melting were systematically studied. The rolling effect was determined using x-ray techniques and microphotog. at successive stages of rolling, and the operating slip systems were determined from observations of slip traces on the side and front **surfaces** rolled. The mean **grain** size and the mean strain were determined by using the Hall method. The rolling **texture** was determined by the x-ray **pole figure** method at successive stages of rolling. Stress-strain relations of various **Ta** single crystals were obtained to clarify the effect of compressive deformation. The mech. **structure** of **Ta** single crystals subject to cold rolling is destroyed in the order {110}-<110> and < **111**.rtbbrac., {**111**}-<110>, and { **100**}-<010> and <011>. The work-hardening effect of **Ta** crystals, examined by using compression tests, is small and decreased in the order of directions <110>, .ltbbrac.**111**.rtbbrac., and < **100**.rtbbrac.. The cold-rolled **texture** of **Ta** single crystals is grouped in {**100**}-<110> and { **111**}-<112> orientations, and it is the same as that of Fe single crystals.
ST **tantalum** single crystal mech property; **crystal orientation tantalum** mech property
IT **Crystal orientation**
(of **tantalum** single **crystals**, mech. properties in relation to)
IT **7440-25-7**, **Tantalum**, properties
RL: PRP (Properties)
(mech. properties of single **crystals** of, **crystal**

orientation effect on)

L88 ANSWER 45 OF 55 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 1988-301005 [43] WPIX
DNN N1988-228464 DNC C1988-133360
TI Semiconductor device with composite electrode structure - having low resistance and improved breakdown voltage.
DC L03 U11 U12
IN ISHIHARA, K; MIKATA, Y; USAMI, T
PA (TOKE) TOSHIBA KK; (TOSV) TOSHIBA MICRO COMPUTER ENG CORP; (TOSV) TOSHIBA MYCON ENG CO LTD; (TOSZ) TOSHIBA MICROELECTRONICS CORP; (TOKE) TOSHIBA CORP; (TOSV) TOSHIBA MICOM ENG CO LTD
CYC 6

PI	EP 287931	A	19881026	(198843)*	EN	8p	
	R: DE FR GB						
	JP 63255965	A	19881024	(198848)			
	KR 9200636	B1	19920117	(199340)			H01L029-78
	EP 287931	B1	19940713	(199427)	EN	10p	H01L029-62
	R: DE FR GB						
	DE 3850599	G	19940818	(199432)			H01L029-62
	US 5612236	A	19970318	(199717)		7p	H01L021-265

ADT EP 287931 A EP 1988-105804 19880412; JP 63255965 A JP 1987-89772 19870414; KR 9200636 B1 KR 1988-4264 19880414; EP 287931 B1 EP 1988-105804 19880412; DE 3850599 G DE 1988-3850599 19880412, EP 1988-105804 19880412; US 5612236 A Cont of US 1988-180842 19880412, Cont of US 1990-472404 19900201, Cont of US 1991-789442 19911107, Cont of US 1993-161080 19931203, Cont of US 1994-231973 19940422, US 1995-383946 19950206
FDT DE 3850599 G Based on EP 287931
PRAI JP 1987-89772 19870414
REP 1.Jnl.Ref; A3...8944; EP 71029; No-SR.Pub; 03Jnl.Ref
IC H01L021-28; H01L029-62
ICM H01L021-265; H01L029-62; H01L029-78
ICS H01L021-28; H01L021-44; H01L021-48; H01L029-40
AB EP 287931 A UPAB: 19940914
A semiconductor device comprises a semiconductor substrate having a main **surface** and a laminated **structure**, which includes a non-monocrystalline Si layer and a layer of refractory metal or refractory metal silicide, pref. one or a mixture of Ti, W, Mo, Zr, Hf, **Ta** silicides, formed on the Si layer and on main **surface** of semiconductor substrate. The resisticivity of the non-monocrystalline Si layer is set at less than 1 x 10 power (-3) ohm/cm by doping with an impurity, pref. P, As, Sb, or B, during deposition of Si layer. Pref. the device is characterised by being formed of an insulated gate FET transistor, and the laminated **structure** constitutes an electrode or wiring section of transistor.

USE/ADVANTAGE - Semiconductor device having improved electrodes and wiring **structures** of particular valve for the formation of insulated gate field effect transistors.
Dwg.1/6
Dwg.1/6
FS CPI EPI
FA AB; GI

MC CPI: L04-E01B1
EPI: U11-C05E; U11-C05E1; U11-C05F1; U12-D02A; U12-E02

L88 ANSWER 46 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1989:16143 CAPLUS
DN 110:16143
ED Entered STN: 06 Jan 1989
TI Graphoepitaxial growth of zinc sulfide on a **textured** natural crystalline surface relief foreign substrate
AU Kanata, T.; Takakura, H.; Mizuhara, H.; Hamakawa, Y.; Kariya, T.
CS Fac. Eng. Sci., Osaka Univ., Toyonaka, 560, Japan
SO Journal of Applied Physics (1988), 64(7), 3492-6
CODEN: JAPIAU; ISSN: 0021-8979
DT Journal
LA English
CC 75-1 (Crystallography and Liquid Crystals)
AB A new type of graphoepitaxial growth of ZnS crystalline thin films was investigated. The substrate is polyimide coated with various thin films. It has an inverted pyramidal replica pattern taken from **textured** **(100)** single-crystalline Si. **Crystallinity** and growth **orientation** of films were examined by SEM and x-ray **pole figures.** The crystal was grown from the bottom of the inverted pyramids. The graphoepitaxial effects are strongly sensitive to the ability of the semiconductor to wet the substrate coating materials at the nucleation temperature The controllability of the **crystallog. orientation** normal to the substrate by the synthetic pattern is >85% in the present technol. status.
ST zinc sulfide graphoepitaxy oxide **tantalum** polyimide; epitaxy grapho zinc sulfide coated polyimide
IT Polyimides, properties
RL: PRP (Properties)
(graphoepitaxy of zinc sulfide on, coated with various thin films)
IT Epitaxy
(grapho-, of zinc sulfide on **textured** natural crystalline surface relief foreign substrate)
IT **7440-25-7**, **Tantalum**, properties
RL: PRP (Properties)
(graphoepitaxy of zinc sulfide on oxide films on, on polyimide)
IT 1314-36-9, Yttrium oxide (Y2O3), properties 1314-61-0, **Tantalum** oxide (Ta2O5) 7631-86-9, Silica, properties
RL: PRP (Properties)
(graphoepitaxy of zinc sulfide on, on **tantalum**/polyimide substrate)
IT 1314-98-3, Zinc sulfide, properties
RL: PRP (Properties)
(graphoepitaxy of, on **textured** natural crystalline surface relief foreign substrate)

L88 ANSWER 47 OF 55 COMPENDEX COPYRIGHT 2004 EEI on STN
AN 1984(2):26183 COMPENDEX DN 840213987; *8473387
TI MAGNETIC AND STRUCTURAL CHARACTERISTICS OF ION BEAM SPUTTER DEPOSITED Co-Cr THIN FILMS.

AU Gill, H.S. (Hewlett-Packard Lab, Palo Alto, Calif, USA); Rosenblum, M.P.
SO IEEE Trans Magn v MAG-19 n 5 Sep 1983, Int Magn Conf, INTERMAG 83, Philadelphia, Pa, USA, Apr 5-8 1983 p 1644-1646
CODEN: IEMGAQ ISSN: 0018-9464
PY 1983
LA English
AB The magnetic and structural characteristics of ion beam sputter deposited Co82Cr18 films were investigated.Films of between 1000A and 10,000A thickness were deposited on glass, titanium, chromium and amorphous **Ta**-W-Ni.The average single angle of incidence of the sputtered species was normal to the substrate **surface.**Film orientation was determined by X-ray **pole figure** analysis.In films deposited on glass with thicknesses below 10,000A, the (**100**) reflection decreased with increasing film thickness.Accompanying this decrease in the (**100**) intensity is a narrowing of the c-axis dispersion.Structural modeling of film deposited on glass indicates that the (**100**) **crystal orientation** decays away entirely at a thickness of 2000A.The magnitude of c-axis dispersion for a given thickness was largest for films deposited on chromium and smallest on amorphous **Ta**-W-Ni.In films with a predominantly (002) orientation, those with greater c-axis dispersion exhibited a greater dispersion of the magnetic easy axis.5 refs.
CC 708 Electric & Magnetic Materials; 701 Electricity & Magnetism; 549 Nonferrous Metals & Alloys; 539 Metals Corrosion & Protection; 722 Computer Hardware; 543 Chromium, Manganese, Molybdenum, Tantalum, Tungsten, Vanadium & Alloys
CT *MAGNETIC MATERIALS:Thin Films; SPUTTERING; DATA STORAGE, MAGNETIC:Film
ST MAGNETIC RECORDING
ET Co*Cr; Co sy 2; sy 2; Cr sy 2; Co82Cr18; Co cp; cp; Cr cp; Ni*Ta*W; Ni sy 3; sy 3; Ta sy 3; W sy 3; Ta-W-Ni; Co-Cr

L88 ANSWER 48 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1980:153524 CAPLUS
DN 92:153524
ED Entered STN: 12 May 1984
TI Effect of oxygen on the **surface** ionization of potassium on the (112) face of **tantalum**
AU Chaikovskii, E. F.; Kovtun, E. D.; Sotnikov, V. T.
CS USSR
SO Zhurnal Tekhnicheskoi Fiziki (1980), 50(1), 193-5
CODEN: ZTEFA3; ISSN: 0044-4642
DT Journal
LA Russian
CC 66-3 (Surface Chemistry and Colloids)
Section cross-reference(s): 65, 73
AB The simultaneous adsorption of atomic K and O on (112) **Ta** **surface** was studied by thermoelectronic emission, **surface** ionization, and Auger spectroscopy. The temperature-dependence of K ionization on (112) **Ta** exhibits a sharply defined threshold temperature, which shifted to higher-temperature values when atomic K beam d. increased. O is retained in **Ta** up to 2250 K. When the emitter temperature was 2300 K, O adsorbed on **Ta** **surface** and subsequently dissolved in

Ta bulk. The Auger spectra of **Ta** acquired a new peak at
17.6 eV, which reflected valence-electron state rearrangement
owing to O adsorption. The **intensity** of this **peak**
increased with increasing duration of **Ta**-O atmospheric contact.
ST **surface** ionization potassium **tantalum** oxygen;
adsorption oxygen potassium **tantalum**
IT Ionization in solids
(of potassium on **tantalum**, oxygen adsorption in relation to)
IT Adsorption
(on **tantalum**, of oxygen, potassium **surface**
ionization in relation to)
IT 7782-44-7, properties
RL: PRP (Properties)
(adsorption and dissoln. of, in **tantalum**, potassium
surface ionization in relation to)
IT 7440-09-7, properties
RL: PRP (Properties)
(adsorption of atomic, on **tantalum**, oxygen effect on
surface ionization in)
IT **7440-25-7**, properties
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(adsorption on, of oxygen, **surface** ionization of potassium in
relation to)

L88 ANSWER 49 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1978:144537 CAPLUS
DN 88:144537
ED Entered STN: 12 May 1984
TI Mechanical properties of **tantalum** single crystals grown by
electron beam melting methods
AU Kaneko, Takeshi; Unohara, Nobuyuki
CS Japan Def. Agency, Tokyo, Japan
SO Nihon Daigaku Kogakubu Kiyo, Bunrui A: Kogaku Hen (1975), 16, 125-36
CODEN: NDKADF; ISSN: 0285-6174
DT Journal
LA Japanese
CC 75-4 (Crystallization and Crystal Structure)
AB Cold-rolled and compression effects of **Ta** single crystals grown
by electron beam melting methods were investigated. The rolling effect
was determined by using x-ray techniques and microphotog. at successive stages
of rolling, and operating slip systems were determined from observations of
slip traces on the rolling, side, and front **surfaces.** The mean
grain size and the mean strain were determined by using the Hall
method. The rolling **texture** was determined by the x-ray **pole**
figure method at successive stages of rolling. Stress-strain
curves of various **Ta** single crystals were obtained to clarify
the effect of compressive deformation. According to x-ray investigations
and **surface** observations, the mech. **structure** of
Ta single crystals subject to cold rolling is destroyed in the
order, (110)-<.hivin.110> and <.hivin.**111**
>, (**111**)-<.hivin.110>, and (**100**
)-<310> and <011>. The work-hardening

effect of **Ta** crystals, examined by using compression tests, was
small and in the order <110>, .ltbbrac.**111**
>, and .ltbbrac.**100**.rtbbrac.. The cold-rolled
texture of Tasingle crystals is grouped in (**100**
)-<110>, and (**111**)-<112>
orientations, and it is the same as the cold-rolled **texture** of
Fe single crystals.

ST **tantalum** mech property; cold rolled **tantalum**;
compression **tantalum**; electron beam melting **tantalum**;
stress strain **tantalum** crystal; work hardening **tantalum**
crystal

IT **7440-25-7**, properties
RL: PRP (Properties)
(mech. properties of single crystal of, grown by electron beam melting)

L88 ANSWER 50 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1976:93814 CAPLUS
DN 84:93814
ED Entered STN: 12 May 1984
TI Substructure and preferred orientation of rolling of pure metals with a
body centered cubic lattice
AU Egiz, I. V.; Guseva, L. N.
CS Moscow, USSR
SO Izvestiya Akademii Nauk SSSR, Metally (1975), (5), 114-18
CODEN: IZNMAQ; ISSN: 0568-5303
DT Journal
LA Russian
CC 56-6 (Nonferrous Metals and Alloys)

AB Electron-beam-remelted Nb [7440-03-1], **Ta [7440-25-7]**,
W [7440-33-7], Mo [7439-98-7] and iodide Cr [7440-47-3] were filed or cold
rolled and the substructure of the deformed metals was examined by x-ray
diffraction. From the stereographic projections of poles in reciprocal
space the broadening of (110), (200), (220), and (400) lines was determined to
estimate the size of regions of coherent scattering, D, the amount of
microstresses $\Delta a/a$, and the d. of dislocations ρ. The (
100) component predominated in the **pole figures**
of filed **Ta** and Nb which indicates the piling-up of dislocations
with the Burgers vector <**100**>. Another strong textural
component was (**111**) probably associated with the cross-slip of
screw dislocations. When cold rolling **Ta** and Nb the reflection
broadening was so weak that neither D nor $\Delta a/a$ could be determined owing
probably to the formation of polygonized **structures.** Negligible
broadening was observed also for filed Mo in contradiction with some earlier
reports (Babareko et al., 1964). The discrepancy may be caused by high
purity of the Mo used. The line broadening observed for filed Cr was
entirely ascribed to the lattice distortion as no drop in D could be
detected.

ST cubic metal deformation structure

IT 7439-98-7, properties 7440-03-1, properties **7440-25-7**,
properties 7440-33-7, properties 7440-47-3, properties
RL: PRP (Properties)
(**texture** substructure of rolled)

L88 ANSWER 51 OF 55 CAPLUS
AN 1974:561105 CAPLUS
DN 81:161105
ED Entered STN: 12 May 1984
TI Attachment to the mass spectrometer MV2302 for chemical research
AU Prokop'ev, V. M.; Boiko, O. S.; Kalygin, V. V.
CS USSR
SO Pribory i Tekhnika Eksperimenta (1974), (4), 225-7
CODEN: PRTEAJ; ISSN: 0032-8162
DT Journal
LA Russian
CC 71-11 (Electric Phenomena)
AB An attachment to the mass spectrometer with gas. ion source (MV 2302) was constructed and used for the study of high temperature (1400°K), heterogeneous reactions in vacuo with the participation of chemical active, Cl-containing gases. A detailed diagram of the attachment is presented. The main features are a quartz reactor heated by a **Ta** ribbon, a gas measuring **arrangement**, a reactor temperature stabilizer, and differential pumping of gases from the ion source. The progress of the chemical reaction is judged from the composition of vapor forming products and gases, emerging from the reactor and falling in the ionization chamber. Chlorination of rare-earth metal oxides with CCl4 in vacuo was studied. Technical capabilities of the attachment are illustrated by the mass spectrometric composition of HoCl3, where ions: HoCl3+, HoCl2+, HoCl+, and Ho+ were detected with the rel. **peak intensities** of: 9.8, **100**, **17**.3, and 56.3 resp.
ST mass spectrometer attachment; holmium chloride mass spectrum
IT Rare earth oxides
RL: RCT (Reactant); RACT (Reactant or reagent)
(chlorination of, mass spectrometer for study of)
IT Mass spectrometers and spectrographs
(for heterogeneous high-temperature chlorination reactions)
IT Mass spectra
(of holmium chloride)
IT Chlorination
(of rare earth oxides, mass spectrometer for study of)
IT 56-23-5, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(chlorination by, of holmium oxide)
IT 39455-61-3
RL: RCT (Reactant); RACT (Reactant or reagent)
(chlorination of, by carbon tetrachloride, mass spectroscopic study of)
IT 10138-62-2
RL: PRP (Properties)
(mass spectra of)

L88 ANSWER 52 OF 55 CAPLUS
AN 1965:458384 CAPLUS
DN 63:58384
OREF 63:10677b-f
ED Entered STN: 22 Apr 2001

TI X-ray spectrographic determination of **tantalum** in niobium by
electron excitation
AU Toussaint, C. J.; Vos, G.
CS EURATOM, Ispra, Italy
SO Analytica Chimica Acta (1965), 33(3), 279-84
CODEN: ACACAM; ISSN: 0003-2670
DT Journal
LA English
CC 2 (Analytical Chemistry)
AB cf. Birks, X-Ray Spectrochemical Analysis, New York: Interscience Pubs., 1960; Bens, CA 59, 120b. **Ta**, 0.4-5% in Nb, is determined by electron beam excitation and x-ray spectroscopic analysis, by measuring the intensity of the **Ta** I Lα1 line. A direct emission spectrograph with a demountable tube having a rotatable Cu anode and Re filament is operated at maximum excitation of 24 kv. and 0.1 ma. Metallic or solid samples were placed in a slit machined in the Cu anode. The Nb samples (containing **Ta** impurity) were cut into 10 + 16-mm. sheets, 1 mm. thick, and polished with a 50-μ diamond paste. Nb-**Ta** alloys were formed into rods by fritting the powdered Nb-**Ta** mixts.; the sheets (10 + 16 + 1 mm.) were prepared from the rods. A curved LiF crystal (radius 750 mm.) analyzer, collimator with 1-mm. slit, scintillometer (at 1100 v.), and discriminator were used. The counting time was **100** sec.; the background, measured at θ = 22.9 and 21.2°, was subtracted from the **Ta** Lα1 line, after interpolation. The limit of detection is expressed by LD = 3n/R(BT)1/2, where R = P/B, P is the **intensity** of the **peak** in counts/sec. (after subtracting the background), B = background intensity, T is the counting time in sec., and n is the concentration of the element in ppm. To determine the maximum R(B)1/2 excitation factor (Spielberg and Bradenstein, CA 58, 11932e), the anode voltage was varied stepwise, 20-30 kv., with constant current of 0.1 ma.; the anode current was varied from 0.1 to 0.5 ma., with constant anode voltage of 20 kv.; and 3 detectors were evaluated. The excitation potential, Ev, of the **Ta** L spectrum is 11.7 kv.; that of the Nb K spectrum is 19.0 kv.; the **Ta** Lα1 line is separated clearly from the 2nd-order Nb I Kα1 line. The limit of detection of **Ta**, calculated from the results obtained from a Nb sample containing 4500 ppm. of **Ta**, with a counting time of 400 sec., is 20 ppm. The precision of determining 0.4-5% **Ta** in Nb is ±2%. A small layer of Re, which was formed on the sample **surface** during the determination, can be eliminated by deflecting the electron beam from a helical Re (or W) cathode, situated below the anode, as described by Henke (Advances in X-Ray Analysis, New York: Plenum Press, 1961, Volume V, p. 285). **17** references.
IT 37256-00-1, Niobium alloys, **tantalum-**
(**Ta** determination in)
IT 7440-25-7, **Tantalum**
(analysis, determination in Nb)
IT 7440-03-1, Niobium
(analysis, determination of **Ta**)

L88 ANSWER 53 OF 55 CAPLUS

AN 1965:79294 CAPLUS
DN 62:79294
OREF 62:14040h,14041a-b
ED Entered STN: 22 Apr 2001
TI Spectral normal emittance of single crystals
AU Dreshfield, R. L.; House, R. D.
CS United Aircraft Corp., East Hartford, CT
SO (1965), (IAA Accession No. A65-13617), 8 pp.
From: Intern. Aerospace Abstr. 5(4), 505(1965).
DT Journal
LA English
CC 10 (Spectra and Some Other Optical Properties)
AB The spectral normal emittances of Mo, **Ta**, and W crystals were measured normal to low **Miller index** planes at 2000°F., 3000°F., and 4000°F. in vacuo. The levels of spectral normal emittance obtained were in good agreement with previously published values for polished **surfaces** of the metals investigated. One **Ta** sample recrystd. in a manner such that the emittance normal to a (211) and a (321) plane could be measured at essentially the same time. A very small difference in emittance did exist at approx. 0.5 μ, with the (211) plane having a higher emittance. A comparison of the emittance of the (211) plane to the (**100**) plane of Mo, the (110) plane to the (**100**) plane of W, and the (110) plane to the (211) and (321) planes of **Ta** showed no significant differences between planes. Differences in polished **surfaces** have a greater effect on the spectral normal emittance of the refractory metals than the **crystallographic orientation** of the emitting **surface.**
IT Emissivity
(of molybdenum, **Ta** and W crystals)
IT 7440-33-7, Tungsten
(emissivity of)
IT 7439-98-7, Molybdenum 7440-25-7, **Tantalum**
(emissivity of crystals of)

L88 ANSWER 54 OF 55 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1963:446878 CAPLUS
DN 59:46878
OREF 59:8423a-c
ED Entered STN: 22 Apr 2001
TI Physical metallurgy of uncommon metals
AU Ogilvie, Robert E.; Norton, John T.
CS Massachusetts Inst. of Technol., Cambridge
SO U.S. At. Energy Comm. (1961), Volume TID-12600, 23 pp.
From: Nucl. Sci. Abstr. 15(13), Abstr. No. 17326(1961).
DT Report
LA Unavailable
CC 20 (Nonferrous Metals and Alloys)
AB Incremental couples at 10% intervals across the U-Nb binary system were prepared and diffused. Irradiation damage of Ni single crystals bombarded with 3-m.e.v. electrons from a Van de Graaff generator were studied by Kossel line techniques. Most defects anneal out below room temperature, and all anneal

out at <400°. The cold-rolled **texture** of **Ta** is described by (200) and (110) **pole figures.** This **texture** may be approximated by the ideal orientations, {112} <011>, {**100**} <011>, and {**111**} <112>. The directionality of Young's modulus, yield strength, and tensile strength of **Ta** is also presented. The effects of thermal gradients on the transformation kinetics and diffusion in U-10 weight % Mo were studied. The alloy U(Fe,Mn) was paramagnetic at 480-10°K. The remanent magnetization of hematite along particular directions in the (**111**) plane and along the [**111**] direction of a rectangular prism was measured during a complete cycle of temperature change between 488 and 77°K. The remanent-temperature relation and the thermal hysteresis effect were also measured. The concept of space filling was developed for presenting geometrical relations of different crystal **structures.** The **structure** of the pseudo-binary system ReTi2-TiSi2 was studied.

IT Crystals
(defects in, of Ni, electron bombardment effect on, and **crystal orientation** in hematite and **Ta** in relation to properties)

IT Diffusion
(in molybdenum-U alloys)

IT Magnetic properties
(of hematite and U alloys with Fe and Mn)

IT Magnetic hysteresis
(of hematite at low temps., orientation and)

IT Magnetic remanence
(of hematite, at low temps., orientation and)

IT Crystal structure
(of metals, properties and)

IT Radiation and Radiation effects
(on metals)

IT Metals
(rare)

IT Rhenium compounds, with titanium (ReTi2)
Titanium, compound with rhenium (ReTi2)
(system, TiSi2-)

IT **7440-25-7**, **Tantalum**
(**crystals** of, **orientation** and mech. properties of)

IT 39418-63-8, Molybdenum alloys, uranium-
(diffusion and transformation in, heat-treatment effect on)

IT 59745-22-1, Iron alloys, uranium-
(magnetic properties at low temps.)

IT 51968-94-6, Manganese alloy, uranium-
(magnetic properties of, at low temps.)

IT 1317-60-8, Hematite
(magnetic properties of, **crystal orientation** and)

IT 183748-02-9, Electron
(nickel bombarded by, effect on properties)

IT 39339-63-4, Niobium alloys, uranium-
(phys. properties of)

IT 7440-02-0, Nickel

(radiation damage of)
IT 12039-83-7, Titanium silicide, $TiSi_2$
(system, $ReTi_2$-)

L88 ANSWER 55 OF 55 CAPLUS
AN 1959:43003 CAPLUS
DN 53:43003
OREF 53:7705g-i,7706a
ED Entered STN: 22 Apr 2001
TI Oriented dioxide films on uranium
AU Waber, J. T.; O'Rourke, J. A.; Kleinberg, R.
CS Univ. of California, Los Alamos, NM
SO Journal of the Electrochemical Society (1959), 106, 96-102
CODEN: JESOAN; ISSN: 0013-4651
DT Journal
LA Unavailable
CC 2 (General and Physical Chemistry)
AB The growth habit of UO_2 on U during oxidation by H_2O vapor was analyzed with the aid of detailed x-ray diffraction work and **pole figures.** The dioxide grows with a (110) planar **texture** that bears no epitaxial relation to the underlying metal crystallites. Although the polycryst. α-U has a strong and anisotropic preferred orientation as a result of fabrication, the oxide forms without azimuthal directionality in the plane of contact. The lack of alignment in the plane of contact was confirmed also in an experiment with a single crystal of U. The **texture** of UO_2 formed during annealing in vacuum also was planar without significant directionality. In such cases, the (**100**) planes were parallel to the **surface** of the metal substrate, and large amts. of UO always were present in such films. Subsequent oxidation of specimens covered with the (**100**) **texture** yielded the characteristic (110) UO_2 **texture.** In incidental exptl. work on the vapor deposition of UO_2 the octahedral or (**111**) **texture** was observed on glass and **Ta** substrates, and the cubic or (**100**) **texture** was developed on several ionic substrates. In a preliminary investigation, the rate law for the formation of UO_2 under conditions that produce such oriented films was logarithmic.
IT Crystal form
(of uranium(IV) oxide films on U)
IT Glass
(uranium(IV) oxide film growth on)
IT 1344-57-6, Uranium oxide, UO_2
(films of, crystal form on U)
IT 7440-61-1, Uranium
(oxide films of U(IV) on, crystal form of)
IT **7440-25-7, Tantalum**
(uranium(IV) oxide film growth on)

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